



Air Traffic Controller is a computer model of an air traffic control situation in which Remotely Piloted Vehicles (RPV's) are operated by the controller in landing on and taking off from designated runways.

32K Extended Basic **TAPE 28.95**

DISK 31.95



By screen game in which bird-like creatures, robots and the devil in t assault your home base which you must defend.

16K Machine Language

TAPE 27.95

DISK 30.95



The Necromancer is about to wage war on earth. He needs his lost gold ring to acquire the power to do so. You must find the ring, take it to Mt. Doom and destroy it in the flames from which it came, thus elminating the Necromancer's evil powers.

32K Machine Language

DISK ONLY 27.95



Arcade Action. Method of play you are the Grabber. The object is to grab the 8 treasures and store them in the center boxes. You start with 3 Grabbers and get extra ones at 20,000 points. Watch out for the googlies! Super high resolution graphics.

32K Machine Language

TAPE 27.95

DISK 30.95



TOM MIX SOFTWARE

3424 COLLEGE N.E. GRAND RAPIDS, MI 49505

To Order Call 364-4791 To Place Orders After 5:00 P.M. Call Our BBS At (616)364-8217

 ADD \$1.00 POSTAGE & HANDLING TOP ROYALTIES PAID MICHIGAN RESIDENTS ADD 4% SALES TAX. LOOKING FOR NEW SOFTWARE



ARCADE ACTION GAMES

VISA"

From Computer Plus to YOU... PLUS after PLUS after PLUS



Model 100 8K \$679 Model 100 24K \$835











BUY DIRECT Here are just a few of our fine offers . . . call TOLL FREE for full information.

COMPUTERS		CGP115	199	SOFTWARE	
Model IV 16K	\$849	DMP100	315		(Tape Version)
Model IV 64K	100000	DMP120	399	Zaxxon	39.95
2 Drive & RS232	1699			The King	26.95
Color Computer 16K	175	DMP200	599	Colorpede	29.95
w/16K ext. basic	255	Gemini 10X	319	Trapfall	27.95
# w/32K ext. basic	100,710,00	Gemini 15	435	Pac Attack	
	345	CITOH Prowriter	375		24.95
Pocket Computer 2	165	CITOH Prowriter II	649	Ghost Gobbler	19.95
Model 100 8K	679	Okidata	CALL	Lancer	21.95
Model 100 24K	835	Epson	CALL	Color Zap	9.95
Model 12 1 Drive	2699	ETC.	Office	Railrunner (Frogger)	21.95
Model 16B 1 Dr 256K	4249	CoCo Drive 0	329	Space Shuttle	28.95
MODEMS				Typing Tutor	19.95
Hayes Smartmodem II	235	CoCo Drive 1	235	Colorcome	49.95
R.S. AC-3		Disk Drive Controller	119		
	129	Extended Basic Kit	89	Telewriter 64	49.95
R.S. Modem I	129	8K Ser/Par Conv.	155	FHL Flex (disk)	69.95
R.S. Modem II	199	Botek Ser/Par Conv.	69	Order 2 pcs. above, to	ake 10% off.
R.S. DC-1200	565	64K Ram Chips	75	R.S. software 10% off II	
PRINTERS		Superpro Keyboard	69.95		
Smith Corona TPI D.W.	545	CCR-81 Recorder	52	Send for complete list	
Silver Reed EXP500 D.W.	475		A 07 (\$10.00)	‡Color Computer 64K requ Drive 0 and FHL Flex D.O.	uires
Silver Reed EXP550 D.W.	695	Kraft Joystick (each)	49.95	Drive 0 and FHL Flex D.O.	
DWP210	7.007	R.S. Joysticks (pair)	22	TOLL POPP	
D111210	629	Video Plus	24.95	TOLL FREE	



We have the lowest possible **Fully Warranteed Prices AND** a full complement of Radio Shack Software.

Prices subject to change without notice. Not responsible for typographical errors. TRS-80 is a registered trademark of Tandy Corp.



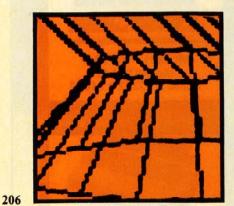
1-800-343-8124

P.O. Box 1094 480 King Street Littleton, MA 01460 617-486-3193

Write for your free catalog

Under the Rainbow

Feature Articles







COVER art © by Fred Crawford

Whose Turn Is It?/Norman Garrett	18
Education Utility Lab Scheduler for frustrated teachers Elements, My Dear Watson/ Gary Benoit	34
Science Valuable info on the known elements	
Word Games/Stephen Lai	60
Game Can you find the hidden words?	"
It's Superpatch! / Roger Schrag Utility Major update of the author's popular patch-to-	00
disk program	
A PAL For CoCo/ Paul S. Hoffman	80
Hardware A close look at the new Multi-Pak Interface	
DRAWing On The Chalk Board/Joseph Kolar	88
Command Quest of the MC-10/ Tom Szlucha	99
Commentary The search for MIC's "hidden" commands	
MC-10 Versus CoCo/Frank Smith	101
Commentary A command summary of the two	
computers Natural Para Kraha	112
Max-A-Mem Value/ Ron Krebs	112
Here Comes The Dragon/Bob Rosen	113
Preview A brief summary of the Dragon 32	
Pieces Of Eighths/ Thomas Gray.	122
EQUICATION Reinforcing measuring skills	
BASIC English/Stephen N. Tchudi	139
Pop's Quiz/ Bruce K. Bell, O.D	152
Education One dad's solution to early math problems	
Developing Computer Literacy/Larry Kheriaty	160
Education The author of Logo and Pilot offers assistance	201
The Art of Vitex93/Edward Krikorian	
Player Piano/Joseph M. Urbas	218
Music See and hear the DATA Statement Rag	
Bridging The Measurement Gap/Jeff Pyne	226
Education An excellent metric conversion program	220
Grade Aid/ Paul N. Luetke Education Utility This teacher's helper averages grades	228
The New 64K CoCo/Dan Downard	236
Preview Discussion of the new CoCo and OS-9	200
Biblio File/ Larry Konecky	252
Education Storing Bibliography info on disk	252
Rainbow Memory Map—III/Bob Russell	273
RAINBUG V/Dan Downard	306
Utility Conclusion of our Rainbug Monitor Series	
Pack Up Your DATA/B.H. Alsop	314
Utility Increase your data storage	

Departments

Letters To Rainbow/Our Readers6
PRINT #-2,/Lawrence C. Falk
Building September's Rainbow/Jim Reed
A many-hued preview to this month's issue
CoCo Counsel/ Tom Nelson28
Copyrighting your software
Education Notes/Steve Blyn50
Programming a computer illiterate school
Education Overview/ Dr. Michael Plog84
Networking for better software evaluation
Rainbow Scoreboard114
Bits And Bytes Of Basic/Richard White130
Examining program control statements
The Pipeline/Staff174
Turn Of The Screw/Tony DiStefano182
Interfacing the GI sound generator
The Dragon's Byte/Bill Nolan192
A combat program
Submitting Material To Rainbow
Corrections
Received And Certified
Greetings From Uncle Bert/Dale Peterson
The many-sided figures of LOGO
Basic Training/Joseph Kolar
Cleaning up the text screen
Assembly Corner/Dennis Lewandowski
Using Graphics/ Don Inman
Brushing up on PAINT statements
About Your Subscription
Back Issue Information
RAINBOW Info
Advertiser Index322
Bob Albrecht's GameMaster's Apprentice will return next month.

Product Reviews

Beyond Words	Multi-Pak Interface/
Bugger	Paul Hoffman80
Catacomb	Music Drill
CoCo-Cooler	Ninja Warrior 156
El Bandito	Number Match 288
Family	Old McDonald's Farm Vowels 170
Fast Lane	Phonics I
Hidden BASIC 1.0 214	Pick Which
Household Budget Worksheet 287	Sea Dragon
Humbug	Spectran
Illustrated Computer	Spelling In Context
Dictionary	Spell-Rite
Indexer	Talking Speller
LCINT 104	Tape Utility
Match & Spell	Time Teacher
Mathfact	VDOS/Frank J. Esser
Math Games That Teach 294	Vocabulary Builder/
Mathmenu/Dr. David Finkel 179	Dr. Charles H. Santee 136
Moptown Hotel	2. Similes II. Suitet Trans. 130

NEXT MONTH: Our graphics issue! Right in time with autumn, nature's most colorful season, we'll emphasize the color in our Color Computers. One graphic special is a flag-waving treat, and others provide you a Halloween trick or

October also brings a new column on OS-9 as Dale Puckett, a leading authority on this operating system, joins the Rainbow's staff of contributing editors.

Plus . . . dozens of articles, dozens of features and dozens of hardware and software reviews—more information on the Color Computer than is available anywhere else.

Make October even brighter. Look for the Rainbow!

The Rainbow

Editor Lawrence C. Falk

Managing Editor James E. Reed

Senior Editor Courtney Noe

Technical Editor Dan Downard

Copy Editor Susan Remini

Submissions Editor Jutta Kapfhammer

Editorial Assistants Valarie Edwards. Suzanne Kurowsky, Noreen Morrison

Contributing Editors Bob Albrecht, Steve Blyn, Tony DiStefano, Don Inman, Joseph Kolar, Dennis Lewandowski, Bill Nolan, Dale Peterson, Michael Plog, Ph.D., Charles Roslund, Dick White

Art Director Sally Nichols

Assistant Art Director Jerry McKiernan

Designer Peggy Henry

Advertising Manager Charlotte Ford

General Manager Patricia H. Hirsch

Assistant General Manager for Finance Donna Shuck

Billing Clerk Monica Wheat

Customer Service Manager Ivanka Kleier

Research Assistants Laurie Falk Deidra Henry, Tanya Holder

Dispatch Mark Herndon

Transportation Wendy Falk

The Rainbow is published every month of the year by FALSOFT INC. 9529 U.S. Highway 42, P.O. Box 209. Prospect KY, 40059. Phone (502) 228-4492. The RAINBOW and the Rainbow logotypes are * Trademarks of FALSOFT, Inc.

Second class postage pending at Louisville, KY, POSTMASTER, Send address changes to Rainbow, P.O. Box 209, Prospect, KY 40069, Fowarding Postage Guaranteed.

Entire contents [®] by FALSOFT, Inc., 1983. **The RAIN-BOW** is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any kind whatsoever.

uted in an "as is" basis, without warranty of any kind whatsoever.
THS-80, Color Basic, Extended Color Basic, Scripsit and Program Pak are "trademarks of the Tandy Coro. CompuServe is a "Trademark of CompuServe Inc.
Subscriptions to the RAINBOW are \$22 per year in the United States. Canadian and Mexican rates are U.S. \$29 Surface mail to other countries is U.S. \$57, air mail U.S. \$85. All subscriptions begin with next available issue. Limited back issues are available Please see notice for issues which are in print and costs. Payment accepted by VISA, MasterCard, American Express. Cash, Check or Money Order in U.S. currency only.

The RAINBOW is represented in the eastern United States by John A. Garland and Associates, P.O. Box 314, S.H.S., Duxbury, MA 02332, (617) 934-6464. Advertisers east of the Mississippi may contact them for further information. information.

RAINBOW

UNDER THE RAINBOW



Editor:

Not that I've run into a CoCo Club or anything, but thought you might like this picture. I'm sitting behind the ponderosa pine with my pole in the water and reading my *Rainbow*.

Don Fruhwald Cincinnati, OH

COCO CUTIE

Editor:

My 20-month-old daughter recently added a new word to her spoken vocabulary—
"'puter." With all the computer owners around, I can't help but wonder how many other toddlers have that word as part of their vocabulary. For about six months now she has been using a musical keyboard program, seldom pounding the keyboard. Her favorite key is, naturally, the red BREAK key which is the highest note.

Claire Miller Rocky Point, NY

MORE NON-EXTENDED

Editor:

Let's see more non-Extended programs in your magazine.

The record idea is good but if it will only have Extended BASIC programs I can't use it. Yes, Virginia and Lonnie, there are some non-Extended CoCo owners in this world.

I have not seen a listing of the quantities of the different CoCos sold by Radio Shack since they were introduced. How many 4Ks, 16Ks Extended and non-Extended, etc.

If this information is not available to you, why not have a poll from your readers?

William M. Vance Crockett, TX

Editor's Note: We recognize the need for non-Extended Color BASIC programs and encourage our readers to submit such programs to the Rainbow. For further details read PRINT #-2.

KUDOS

Editor:

I enjoyed the article and program in the June issue on solving cryptograms by Chris Reid. I typed in the programs and when it did not work I tried everything I knew. Then I sent a letter to Mr. Reid. He was very helpful in the reply he sent. I want to commend Mr. Reid for his patience (two letters offering suggestions) and help.

The entire Rainbow magazine is excellent, keep up the good work.

Richard Urich Sellersville, PA

Editor:

I love your magazine! When I first subscribed in March, I thought the subscription rate a little high. But it was worth every penny. Compared to the other magazines, this magazine is the greatest! I especially like all of your assembly language articles and tutorials. Keep it coming.

Mike Brenneman Leola, PA

Editor:

As a gift for Father's Day my three children gave me \$22 to buy a subscription to Rainbow magazine. Their reasons were that they saw me drive 26 miles three times a month just to insure getting one of the three magazines (Rainbow) the bookstore would get. Can you believe that? Three magazines for a town of over 59,000 population.

You have a good thing going—please don't stop. Your magazine is worth twice the price.

Rick Maurer Rantoul. IL

HINTS AND TIPS

Editor.

Phillip Beistel's program Shuffle in the July issue of Rainbow is a dazzling modernization of Sam Loyd's famous 14-15 puzzle. Like the original 14-15 puzzle, if there is one small error with some of the starting arrangements, the puzzle is unsolvable.

Sam Loyd intentionally presented the puzzle with all the tiles in order except for 14 and 15, which were reversed. He offered a \$1000 reward to anyone who could find a sequence which would put the 14 and 15 in their correct order. It is said that ships were wrecked and trains derailed while their respective pilots tried to solve this confounding puzzle.

To spare the reader from a similar fate, I present below a randomization routine which always generates a solvable arrangement. These program lines should replace

the corresponding lines in Beistel's listing.

14 FOR X=1 TO 4: FOR Y=1 TO 4: A(X,Y)=Z:

Z=Z+1: NEXT Y,X: SCREEN 0,0

15 FOR X=1 TO 4: FOR Y=1 TO 4: IF X=4 AND Y=>3 GOTO 18

16 RX=RND(4): RY=RND(4): IF (RX=X AND RY=Y) OR (RX=4 AND RY=4) GOTO 16

17 Z=A(X,Y): A(X,Y)=A(RX,RY): A(RX,RY)=Z

18 NEXT Y,X: X16=4: Y16=4

The reason for this situation is that Beistel's randomization routine (lines 13-18) arranges the titles in a completely random order. This type of algorithm produces both odd and even permutations of the titles. Any set of moves on the 14-15 puzzle, on the other hand, only produces even permutations. Combinations of even permutations only produce more even permutations.

This was the problem with the original 14-15 puzzle. By swapping just one pair of titles, Loyd induced an odd permutation on the puzzle which made it unsolvable. An excellent discussion of permutations as related to puzzles of this type (including that mind boggling hexahedron) may be found in Puzzle It Out: Cubes, Groups, and Puzzles by John Ewing and Czes Kosniowski (Cambridge University Press.)

James W. Stelly Houston, TX

Editor:

With the advent of word processors and other software programs with upper and lower case screen displays with up to 80 columns, there may be a problem of poor resolution.

I have a tip that may help by eliminating most interference on your TV type monitor. Carefully wrap the computer output cable with heavy duty aluminum foil and then ground this shield to various places on the TV set by trial until you have eliminated the screen interference. (Try attaching to one lead of the internal antennae.) Grounding to an earth ground may also be helpful.

We really enjoy your magazine!

Ben H. Little Portage, WI

Editor:

I have been experimenting with the speed up POKE commands and have found that you can CSAVE and CLOAD while in the speed up mode. You first load in the program you want to save. Second, POKE 65495,0 and then CSAVE your program. When you want to CLOAD it, first POKE

65497,0 and then CLOAD it. The volume on your cassette player should be set louder than usual. Note: this method has not always worked with all my programs, but did work with a lot of them. After your cassette player stops, Poke 65496,0 to put the computer back to normal.

Keep up the good work, Rainbow.

Anthony Graves Louisville, KY

Editor:

I read a great book, "Assembly Language Graphics for the TRS-80 Color Computer" by Don Inman and Kurt Inman. It is an excellent tutorial and great reference book. Hats off to B. Dalton Bookseller stores for really getting into personal computing books.

> Rusty Bernard Shreveport, LA

Editor's Note: Many B. Dalton Bookseller stores now also carry the Rainbow.

Editor:

I would like to bring to your attention two TV shows dedicated to the computer. One can be seen on PBS, the other on cable systems offering SPN. Although neither of the two programs concentrate on any particular brand name or system, new software and hardware are featured on each show.

The "Computer Programme" on PBS was originally produced in England and offers a wealth of information including some wonderfully clear explanations of BASIC programming as well as featuring some of the latest applications for the computer. It is a serialized show that "builds" from week to week. It appears to be designed to increase the computer literacy of the general public.

SPN's "Personal Computer Show" is produced in Texas (home base for Radio Shack, T.I., and others) and is a "magazine" type show. Besides offering stories and interviews on software, hardware, and applications, they are giving away computers. Because the show is still in production, they do answer questions on the program.

Both shows are a real service to computerists in every level of endeavour. Check your TV listings. Yes, Virginia, there are other uses for a CRT.

> James E. Barnett Latham, NY

SOUNDSHEET SOUNDOFF

Editor:

I want to compliment you on your fine magazine. You have the best Color Computer magazine around. The record inside the 2nd Anniversary issue was a great idea that I would like to see again. Keep up the good work!

> Barry Martin Houna, LA

Editor's Note: It appears that we will not have the soundsheet in the Rainbow on a regular basis. For more details, please read PRINT#-2.

Editor:

I have been a Rainbow subscriber for eight months now and your 2nd Anniversary issue was the best yet. I get the other CoCo magazines, but the Rainbow beats them all, in quality as well as quantity.

I especially enjoyed the sound recording. All three programs loaded without an error. I think the inclusion of a record on a regular basis would be well worth a price increase.

I am looking forward to your next issue. J. Paul Fountain

Denton, MD

Editor:

I loved the soundsheet in your 2nd Anniversary issue. I hope you can continue to include them, especially for the longer programs. I often hesitate in typing in long programs unless I am certain of their value to me.

I am uncertain about your price increase for the soundsheet. You said something about "increase prices a little" and "very expensive" in the same sentence in your PRINT #-2 column. The soundsheet is of obvious value but I hope it is well under the price of Rainbow on Tape and other tape magazines.

Keep up the good work. Your magazine is the best around but you have competition. Our little CoCo has started to get the attention it deserves.

> Dwight A. Spitzer Mio, MI

PLAY IT AGAIN, SAM CHIP

Editor:

Congratulations on your innovative July 1983 issue. I transferred the programs from record to tape without any difficulties at all. I hope you will consider repeating the inclusion of a soundsheet on a regular basis.

Keep up the great work.

Paul Kapaldo N. Olmsted, OH

Editor:

I began my subscription to the Rainbow in March of this year so I have no idea what the magazine was like in the "old days," but I want to compliment you on the appearance and content of the Anniversary issue. The record is a great idea and if you could include records regularly without increasing the cover cost more than \$1, you'd have a good thing going. Perhaps you could include a longer record every other month.

To play the record, I bypassed by stereo and plugged the turntable output directly into the computer record. The first time I was able to load the last two programs on the record, but it took several re-recordings and CLOADs before I got the first program to

> Dick Wilson Auburn, MA

Editor:

Please hear an impassioned plea from a subscriber with little money and less time. I'm working my way back through school with my eye on a Bachelor's in Information Systems, while working part time (have to keep up the mortgage payment somehow), and the only thing in shorter supply around my house than cash (can't afford tapes) are

minutes. Let it be that we can see more of these datacordings in future issues of your magazine. Even if you were to include only half the programs that your tape edition does, I could rest more easily at night, knowing my monthly issues of Rainbow weren't going to waste while I frittered away my time with such mundane concerns as college, work, and family.

A little more money per issue I can handle, although the prices of taped editions will probably remain out of my reach until sometime after graduation.

> Richard Williams Tuscon, AZ

Editor:

Just received the July issue and it is superb. I was blown away by the record. It transferred to tape and was readable the first time! Great idea! Why hasn't someone done this before?

Yes, I would pay more for the magazine if it always had a record enclosed. Naturally how much more depends on the quality of your programs. The Special Adventure issue would have been a natural.

Keep up the good work.

Phil Humbaugh Hartsdale, NY

Editor:

As I flipped through the 306 pages of the July issue of the Rainbow I was very pleased to find a soundsheet (record) contained within its informative pages. And then after reading your column I wrote you to tell you that I think it would be an absolutely fabulous idea to include one of these soundsheets in every issue of the Rainbow. I also feel that this kind of an "additive" to the Rainbow would easily substantiate a subscription price increase.

> Mark Abela Agincourt, Ontario

Editor:

I wanted you to know that I thought the soundsheet in July's Rainbow was a great idea. It would be worth a little extra each month to see you continue and expand it.

Thomas Ebling East Wenatchee, WA

Editor:

Okay you guys, so you've proved your point. Your magazine is the best computer magazine going. Only the best would actually publish a record. Keep it up! But tell us, what's next? Perhaps a computer radio station that "spins" programs? I leave it up to you. Thanks to this ingenious idea of yours, I will renew my subscription for a few more decades when it runs out.

> Chris Harland Regina, Saskatchewan

MOTIVATION—NOT REWARDS

Editor:

In the July issue of the Rainbow, Carol Kueppers wrote a review of our Fraction Math Quiz program. In the title of that review, the word "defects" was used incorrectly and, therefore, unfairly. Defect implies a defective product, one that does not function as it was designed to function, and that certainly is not the case with *Fraction Math Quiz*. However, rather than take issue with that unfortunate choice of words, I would like to present to your readers the philosophy behind the design of *Fraction Math Ouiz*.

Whether or not an educational program's attributes are defects, as Ms. Kueppers contends in her review of Fraction Math Quiz (the Rainbow, July 1983, p. 167), or assets depends on one's point of view and, more importantly, on one's educational philosophy. Ms. Kueppers believes that since the program does not provide a strong reward, such as a game to play after correctly working a number of exercises, children will have no motivation for using the program for math drill. I, along with many other educators and most parents, believe that a child's primary motivation for any task should come from the satisfaction of a job correctly done and not from some variation of a carrot-tied-to-a-stick (as in "if you finish your homework, you can have an extra dessert"). This philosophy does not exclude a "pat on the back" for a job well done, nor does it exclude some fun along the way. It simply says that the fun should not be the primary motivation for the child's good performance. Indeed, Ms. Kueppers sums this philosophy up very well when she says that "you should provide the motivation and reward that the program lacks.'

Fraction Math Quiz was designed, written, and child-tested with exactly this philosophy in mind. The personalized prompts and musical rewards provide the pat on the back, while the "Starship Commander" menu choice provides a short, enjoyable diversion, as well as an object lesson for children who wonder why they are learning math when a computer can do it so much faster. From this point of view, the program's "defects" become assets that will help a child develop a strong sense of self-motivation.

J.D. German, President Creative Technical Consultants Cedar Crest, NM

INFORMATION PLEASE

Editor:

I would like to install a TRS-80 MOD I keyboard in my CoCo. Do you know of any instructions for this, which includes cutting traces, etc.? I have a "retired" MOD I with a perfect keyboard, and I could figure out the modification in time, but if someone has already done it, it could be very helpful and a time-saver.

Also, I did get a chance to attend one day of the *Rainbowfest*—it was super! It looks as though a follow-up next year could be twice as big—and I'll attend again if it is held at Woodfield. Thanks very much for sponsoring the "CoCo Expo."

Clay Howe Sturgis, MI

Editor:

I'm thinking of buying a Tally Mannesmann printer Model MT160L Revision C

and would like to match it to my CoCo.

1) Can I connect it directly to my CoCo as is with no additional interface? 2) Should I expect a problem finding a cable or making one? 3) Will I be able to use the full potential of both printer and computer? 4) Can I use and print information with my CompuScrv ROM pack?

Any information would be greatly appreciated.

William Burns 7215 Juniper Drive Everett, WA 98203

Editor:

I definitely like the new look. I also am increasingly impressed with the quality of your programs and articles.

This letter is being written on my Rainbow word processor using the spooler program in the June issue. What a super spooler! I have been watching the Rainbow grow since February 1982 and am pleased to say that every issue has been like opening a present. Speaking of presents! My family has decided to give me a subscription to the Rainbow for my Father's Day gift. That's terriffic except that now I need another excuse to visit my friendly neighborhood computer store.

Does anyone know how to insert lines in this word processor? Sometimes it would be good to open up the text.

> F.W. McKenzie Saugerties, NY

Editor:

I am a new subscriber to the Rainbow but rest assured that as long as I have my CoCo I shall remain on your list.

I am looking for a disk based RTTY program for the Color Computer but am not having much luck.

James A. Chandler Abilene, TX

Editor.

I need help solving Bedlam! One of my problems is getting the green key. If anyone can help me get out of Bedlam, please contact me at 215 North 39th Street. Also, how do you get the people in Bedlam to help you?

Brian Gantert

Allentown, PA 18104

CONTRIBUTIONS PLEASE

Editor:

l represent a non-profit, charitable organization which uses TRS-80 Model I equipment in virtually every aspect of its affairs. We would be grateful if your readers would consider contributing additional Model I equipment: keyboards, expansion interfaces, drivers, and printers would be welcome. All contributions would be fully tax-deductible, since we hold "public charity" status with the IRS.

If you are in a position to make such a contribution or would like more information, please drop me a note or call me (collect, if you like) at (617) 495-9020.

Robert Epstein, Ph.D. Cambridge Ctr. for Behavioral Studies 11 Ware Street Cambridge, MA 02138



Editor:

On the way to work recently I spotted this license tag on the car in front of me. A "source" in the County Clerk's Office tells me the tag is a regular issue and not a special personalized plate.

Jack Gurner Memphis, TN

LITTLE PLEASURES

Editor:

This is why I bought a CoCo: I was having a keyboard problem. Sound familiar? I took the computer in Thursday, and on Friday I had a new keyboard in good working order. Maybe I am still at the stage where small things amaze me. But I do doubt, very seriously, that any of the competition in Lancaster could fix this or similar comparatively minor problem(s) at the store. I probably would need all sorts of mailing materials in hand.

Now, more than ever, I will tout the advantages of owning a CoCo! Your magazine is great! The mix of simplicity with sophistication is just fine. I only wanted to find out what all the screaming about the computer revolution was all about. Now I'm hooked!

John Spencer Lancaster, PA

JAPANESE PHONEMES

Editor:

I am writing in answer to R.W. Odlin's letter in your April issue. I am quite sure the fellow in Houston purposely added those strange hieroglyphics to the CGP-115 to increase international sales. It is the Japanese phonetic system—Katakana. Computers in Japan have the katakana on their keyboard for print, input statements (programming is still done in BASIC) and a printer without this capability would be useless.

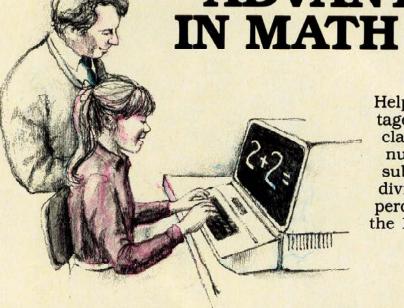
Toni Strong Okinawa, Japan

A FINE EXAMPLE

Editor:

I would like to thank Brian James for a fair and accurate review of our CoCo-Accountant program. He mentioned a number of functions he would like to see included in the program, and I am pleased to say that the revised version, which was not available at review time, has a number of improvements. It will allow the entry of both checks and credit card expenditures, list accounts to the printer, allow the setup of income accounts and provide a printed spreadsheet showing expenditures by month and account for the entire year.

GIVE YOUR CHILD AN UNFAIR **ADVANTAGE**



Help your child gain an advantage by using one of our classroom-tested programs in number concepts, addition, subtraction, multiplication, division, fractions, decimals & percent, pre-algebra, or one of the 15 math games that teach.

For students in grades K through 9, on tape or disk. For TDP and TRS-80 32K Color Computers with extended basic. These professional-quality programs use high resolution graphics with text and sound. They have been written by experienced teachers, tested and revised to provide high-quality and highly motivating instruction. And while you are asking, ask to see our reading and language programs as well.

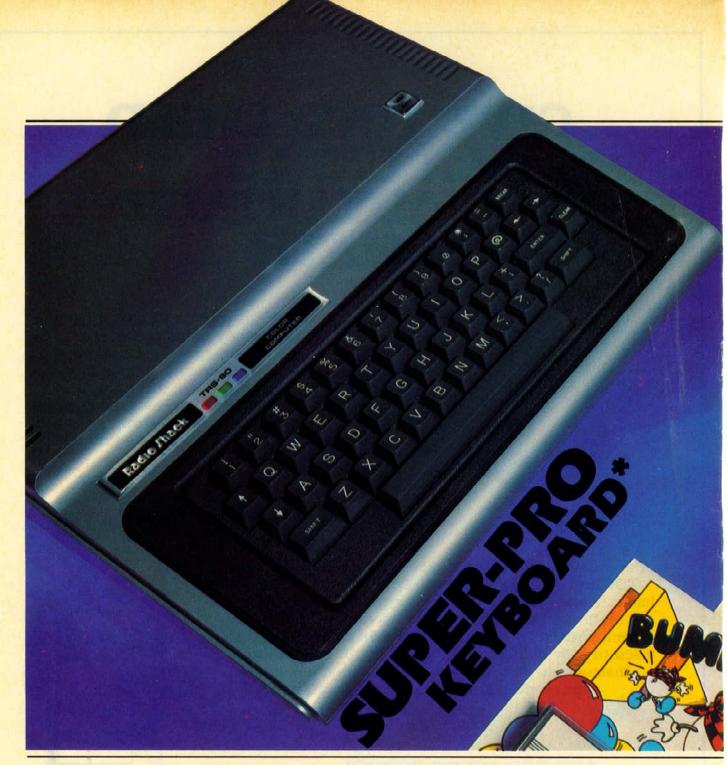


ASK FOR MICRO SCHOOL PROGRAMS BY NAME at your local computer store.

BERTAMAX INC. Max Jerman, Ph.D.,

MICRO President

PERSONALIZED INSTRUCTION ON PERSONAL COMPUTERS



- Professional, low profile, finished appearance.
- U.S. made—high quality, quad gold contacts.
 Smooth "Touch Typist" feel—no sagging.
- Original key layout.

- No soldering—fast, simple installation.
 No special software required.
 Individually boxed with full instructions.
- Only \$69.95.

AT YOUR FAVORITE DEALER OR DIRECT FROM

* Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add \$4.95.



ALL ORDERS: Please add \$2.00 shipping and handling in the Continental U.S. All others add air shipping and \$3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. We accept VISA and MasterCard.



NEW ARCADE GAMES

GLAXXONS / EL BANDITO / COSMIC CLONES / BUMPERS

OTHER GREAT ARCADE GAMES

HAYWIRE / ASTRO BLAST / CAVE HUNTER / SPACE RAIDERS Arcade Games, Cassettes 24.95—Require 16K / Discs 29.95— Require 32K

ADVENTURE GAMES

CALIXTO ISLAND / THE BLACK SANCTUM Adventure Game Cassettes 19.95—Require 16K

Mark Data Products

4001 ALICIA PKWY., NO. 207, MISSION VIEJO, CA 92691 (714) 768-1551

WITH **3-DIMENSIONAL** GRAPHICS



BY DALE LEAR

Down there — below and to the right — tongues of fire play across the face of a skyscraper like living things. Inside the copter, runaway temperatures nearly rip the consciousness from your heat-punished body, momentarily throwing you off course. But panic taps a hidden reservoir of strength, and with an adroit push on the throttle, your FIRE COPTER continues to knife through the swirling plume of smoke, carrying its lifesaving water jets directly into the flames.

FIRE COPTER is joystick-controlled and accomodates one or two players. Ready for three-dimensional realism? Then you're ready for FIRE COPTER — the hot new arcade game from Adventure International!



To order, see your local dealer. If he does not have the program, then call 1-800-327-7172 (orders only please) or write for our free catalog.

DEALER INQUIRIES ARE INVITED!



OR YOUR COLOR COMPUTER

Mr. James' review was a fine example of constructive criticism, and we had reached many of his conclusions ourselves.

Michael J. Himowitz, President Federal Hill Software Baltimore, MD

MAGIC ANSWER

Editor:

In a recent edition of the Rainbow, a reader asked for an explanation of the Magic Numbers on the front of the NANOS reference card for the Color Computer. Here is an answer, direct from NANOS.

"The Magic Numbers work as follows: When you subtract a graphics code from the magic number, the result is the number of the graphic which is the inverse or opposite of the original code.

"So, you can peek a number from the screen, subtract it from the original 'Magic Number,' and poke the result out, thus, reversing your screen display."

Hope that answers the question.

HaroldL. Laroff Monsey, NY

INPUT IRRITATION

Editor:

I can't believe it, you've done it again. Please, please, please do not label programs 16K if they are for Extended Color BASIC. I just spent about three hours coding in your Finding Enrakian Treasure game when I suddenly ran into ECB commands. This has happened to me many times! I have written before on this subject and am beginning to get irritated. Those of us with BASIC get very few programs from Rainbow, and it is very disappointing when the program that appears to be for us is not.

Kathy Maurer Hamilton, OH

Editor's Note: Sorry, Kathy. We regret the error and will be more careful in future issues.

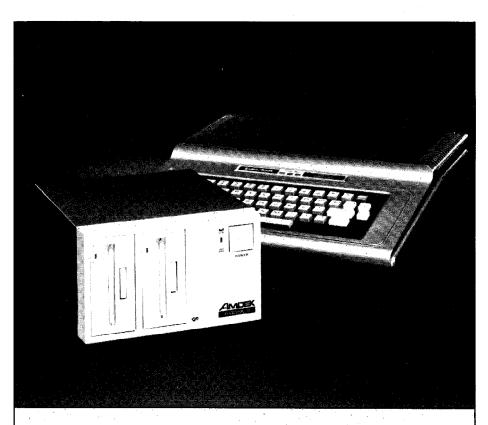
16K, TOO

Editor:

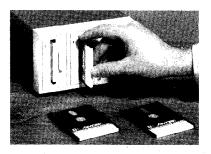
Thank you for your prompt, accurate, and gratifyingly glowing review of Spectrosystems' Fastape utility (July) for high-speed cassette operations. I would, however, like to correct a small inaccuracy that appeared in the Received and Certified section of the same issue, when Fastape was described as a 32K program. As correctly stated in the review, Fastape adjusts itself for the memory capacity of the machine it is running on, and thus is compatible with 16K as well as 32K CoCos.

Anyone desiring further information about the program is welcome to leave mail to me on Compuserve, addressed to 72355,-407.

Arthur J. Flexser Spectrosystems Miami, FL

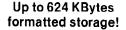


NEW 3" ADD-ON DISK DRIVE.



ONLY \$499.00

USER GROUPS AND EDUCATIONAL INQUIRIES INVITED



Turn Your Rainbow into a Computer Goldmine Machine. Get the new, economical Amdek 3" disk-drive system. It's compatible with your Co-co and features two super-compact 3" hard-plastic encased diskettes for up to 624 KBytes formatted storage. The diskettes fit into a shirt pocket . . . and they're easy to mail, too. Expand your Rainbow to allow you to do more, and relax because your media is durable.







DJR MICRO

321 STATE STREET ST. JOSEPH, MICHIGAN 49085 1-800-732-7323

PRINT #-2,



Te're just about to pop for telling you the news that we've planned four of our RAINBOWfest shows for the coming year. And the first one? It'll be in Ft. Worth — home of Radio Shack.

RAINBOWfest in Ft. Worth will be October 14-16 at the Hyatt-Regency Ft. Worth. It (and the others to come) will follow the same pattern that made the very first **RAINBOWfest** so successful this spring in Chicago. There will be a breakfast with a nationally-known speaker, a series of seminars and the biggest and best show of Color Computer software, hardware and other materials ever assembled in one place.

We are very pleased to announce that Ed Juge, director of computer marketing for Radio Shack, will be our breakfast speaker in Ft. Worth. Ed is extremely well-known and knowledgable and we are proud to have him with us.

Other RAINBOWfest shows will be in Long Beach, California, February 17-19; just east of Philadelphia, Pa., April 6-8 and in Chicago June 22-24. All will be at Hyatt House

Hotels and all will have the same general format of a big exposition of Color Computer products, a well-known breakfast speaker and a series of seminar sessions.

The way we selected this year's sites is simple: Ft. Worth goes without saying, as headquarters for Radio Shack; we thought Southern California would be a nice place to be in February; Chicago was so successful last year, and so close to Canada and the Great Midwest, that we just had to do it again; while the Philadelphia site (just 6.3 miles from Independence Hall and the Liberty Bell) brings CoCo Community to the populous East Coast for the first time!

Subject to some modification, exhibit times will be 7-10 p.m. on Friday, 10 a.m.-6 p.m. on Saturday and 11 a.m.-4 p.m. on Sunday. Tickets can be had for \$8 for a three-day ticket in advance (\$12 at the door) or \$6 for a one-day ticket (\$8 at the door). Breakfast tickets are \$11. There is a \$1.00 handling charge for each advance order.

There are details on another page, and an order form (look for **RAINBOWfest** in the advertiser's index) with deadline information and the like. But, I hope you will come to one or all of these shows. Last spring, **RAINBOWfest** was one of the most exciting things in the CoCo Community. Please come to one or more of them this year!

As you can no doubt tell from our cover, this is our Annual Education Issue. But, as the wizardry of cover artist Fred Crawford shows, too, there is something else afoot this month.

In a way, we designed the cover of this month's issue of *the Rainbow* on purpose to combine a report on the new Color Computers from Radio Shack and what has become our longest-running special issue theme.

We all should be gratified by the new CoCos coming our way from Radio Shack. Not only are they excellent machines, but they should lay to rest — for now and forever — the words of the doomsayers who have, off and on, predicted the demise of the Color Computer.

What we see here is not so much two new Color Computers but a *line* of Color Computers. In making a commitment of this sort to CoCo, it seems to me that Tandy is saying, for once and for all, that the Color Computer is here to stay.

For, as you know, there is more to this than just the hardware of the 64K Color Computer and the Color Computer 2. You can bet that other products are in the works to support these machines—one of which is certainly the OS-9 operating system which will be available with the 64K model.

And not-so-incidentally, these are sleek, well-designed computers. Again, Radio Shack has done a most excellent job. Check them out and I am sure you will agree the new Color Computers are truly a "cover" story!

You will see all sorts of interesting articles on the subject of education in this month's issue, but there are some things missing.

(continued on page 172)



THE MICRO COMPUTER BUSINESS WILL GROW FROM \$10 TO \$100 BILLION IN THE NEXT EIGHT YEARS! ARE YOU READY TO CASH IN?

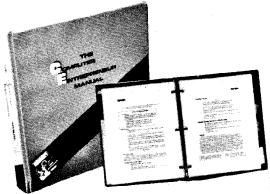
The micro computer business is predicted to grow from its present \$10 billion to \$100 billion before 1990! Imagine the possibilities this opens for you! No matter where you live, if you're starting up or presently in business, no other industry offers you more opportunities!

Now, finally, all the inside information you need to secure a prosperous future in this dynamic industry is available in one place - THE COMPUTER ENTREPRENEUR MANUAL! — An immense information source, compiled by our inquisitive research team, aided by a panel of experts and business people from all areas of the computer industry!

We present the inside story of more than 100 lucrative computer businesses you can enter, where you'll find the real opportunities for the eighties: from one man operations like Programming Author, Word Processing Center or Consulting, to Systems House, Service Bureau, Computer Store etc! Many at little or no investment! All the invaluable facts and figures: How to start, Capital needs, Profit estimates and Margins, How to Sell and Market, How missing technical or business experience need not stand in your way, Source of Suppliers, etc! Details that could take years to find out on your own!

We'll show you inside tricks, like how to never again pay retail for computer products and consumer electronics, even for one item - right now, while you're starting your business! How to get free merchandlse and trade show invitations, etc. This alone will more than pay for the manual! You'll read actual case histories of other computer entrepreneurs, so you can learn from their mistakes, and profit from their success stories! Where you'll be one year from now depends on your actions today! Let us show you how to take the first crucial steps!

Order now and take advantage of our limited introduction special, THE COMPUTER ENTREPRENEUR MANUAL, and a six month subscription to THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER (so you're always up-to-date with the industry), both for only \$29.95! You must be convinced on how easy you can strike it rich in the micro computer business - or you may return the manual for a full refund within thirty days! USE OUR TOLL FREE NUMBER TO ORDER!



EVERYTHING YOU NEED TO KNOW TO SUCCEED IN THE COMPUTER BUSINESS IS ALL IN THIS MANUAL!

THE COMPUTER ENTREPRENEUR MANUAL has the answers to all your questions about selecting, starting and succesfully running a computer business! There has never been such a comprehensive collection of know-how and information about this business in one place! All the facts you need to plan and achelve your goals in easy-to-follow, step-by-step instructions!

These are some of the 100-plus businesses covered in PART ONE of the manual, with the facts on How to start and run, Start-up Cost (Even how to operate on a shoestring), What profits to expect, Wholesale prices, Mark-ups, Suppliers, future outlook, case histories for each, etc:

Systems House, Software Author (who to sell to and who to avoid). Service Bureau, Software Publisher (How to find programs that sell, Word Processing Service, Consulting and Consultant Broker (use your skills or those of others, make \$150 - \$1000 a day!), The incredible Games Business, Computer Store (Franchises: Pro and Contra, or a low inventory store in your home!), OEM, Hardware Mfg, Data base and Teletext Service (big prospects!), Used Computers, Repairs, Rent-A-Computer, Promote Fests and Trade Shows, Turnkey Systems,

Bartering, Mail Order, Compile and rent mailing lists, Specialized Data Headhunting and Temp Help Service, Tech Writer Shop, Custom Engineering, The highly profitable Seminars and Training Business, and many more!

Many new ideas and ground floor opportunities! Interviews and success stories on companies of all sizes! Privy into on the profits made: How some computer store operators net \$100 - \$250,000! Little known outfits that made their owners millionaires, one of these low-key companies, making simple boards, went from nil to \$20,000,000 and 100 employees in four years! Programmers that make \$300,000, Thousands of micro millionaires in the making, etc!

Whatever your goal is - Silicon Valley Tycoon, or just a business at home - we guarantee you'll find a business to suit you - or your money back!

PART TWO of the manual is loaded with the know-how and "streetfighting" savvy you need, both as a novice or business veteran, to get started, to stay and to prosper in the micro computer business! A goldmine of information in clear and easy-to-use instructions: How to prepare your Business Plan, Qutside financing, The mistakes you must avoid, How to hire and manage employees, Incorporation (when, and how to do it cheaply), Surviving bad times, Record Keeping, how to estimate your market before you start, Use multiple locations to maximize profits, how to promote and stay steps ahead of the competition! How to get free advertising, free merchandise, free advice, Power negotiating with suppliers to double your profit margins, etc! Even how to keep a present job while starting a business part time!

Don't miss this opportunity to be part of this great industry - the next success story could be your own! Order the manual today! Part one and two, bound in a deluxe ring binder, where you can also collect our newsletter (free for six months with the manual - a \$32.50 value!) - all for only \$29.95!



THE COMPUTER ENTREPRENEUR NEWSLETTER -ALL THE LATEST INSIDE BUSINESS NEWS! NOW! SIX MONTHS FREE WITH YOUR MANUAL!

You're always attuned to the industry, and your manual kept up-to-date, with our newsletter! Each issue has the latest business news, ideas, new suppliers, our indispensible "watchdog" column on profits, discounts (don't miss mfg's promos, like recently, when top video monitor sold at \$80 - that's half wholesale, one third of the retail price!), the competition, the big deals, etc! Feature stories with start-up info and case histories on new micro businesses!

You'll get invitations to trade shows and conventions, the usage of our advisory service and our discount buying service for your purchases!

You'll find many items in our newsletter that will save you the cost of your manual many times over!



CALL TOLL FREE! CHARGE IT! Credit Card Orders

(MC, VISA only) accepted 24 hours/day 1-800-227-3800

Ask for extension 1135



VISA

Exp. Date:

SIGNATURE: -

Order by phone (Credit cards only), or use the coupon:

3	
	Mail to THE COMPUTER ENTREPRENEUR PUBLISHING CO. PO BOX 456, Grand Central Station, New York, N.Y. 10163
E	Please send me THE COMPUTER ENTREPRENEUR MANUAL, and the six month free subscription to
	THE COMPUTER ENTREPRENEUR REPORT/NEWSLETTER. All for only \$29.95, plus \$3 for postage/handling (NY residents: add \$2.64 for sales tax). If I decide not to keep the manual. I may return it within 30 days for a full refund.
=======================================	NAME:
Ē	ADDRESS: ————
	CITY, STATE, ZIP: Charge to VISA MC
Ξ	CADD#

RB0983

©1983 THE COMPUTER ENTREPRENEUR

P.O. Box 16842 -- Sta. B

P.O. Box 16842 -- Sta. B Greenville, South Carolina 29606 (803) 233-2700

PRESENTS



ATARI* JOYSTICK'

you use the famous:

Just plug your Atari or Atari like joystick (the Color-Stick enables the use of most joysticks made for the Atari) into the Color-Stick interface and then plug the Color-Stick into an empty joystick port.

The Color-Stick can improve scores 50% and more while making some games more exciting and fun to play.

Don't settle for cheap imitations. Only the **ORIGINAL** Color-Stick's small inline design allows you to just plug your joystick into it and forget it. The Color-Stick becomes a part of your joystick so it does not interfere with your game playing. In addition Color-Stick returns a full value of '63' for the right and down directions, even when using two joysticks and even in the diagonal directions, the others don't.

NOW Color-Stick has a new low price......

Color-Stick interface \$10.95 each two for \$19.95 (less joysticks) Atari joysticks \$9.95 each

ETTER OFTWARE COMPANY

P.O. Box 16842 — Sta. B Greenville, South Carolina 29606 (803) 233-2700

Don't miss out order the **ORIGINAL**. Send your check or money order or better yet call today and order your Color-Stick.





Add \$2.00 per order shipping and handling. Bank cards welcomed (please include expiration date). Orders paid by cashiers check, money orders, bank cards and C.O.D. are shipped within 48 hours. Personal checks please allow 1.2 weeks. C.O.D. orders add \$1.50 extra. S.C. residents add 4% sales tax. *TRS-80 is a registered trademark of Tandy Corp. Atari is a registered trademark of Atari, Inc.

BUILDING SEPTEMBER'S RAINBOW

Our annual education issue . . .
Plus, two new CoCo's introduced . . .
And, Radio Shack's OS-9 arrives . . .

Then my mother gets in a story-telling mood, one of her favorites is about how I spent most of my first school year disrupting class; you see, she was the teacher. It wasn't a one-room schoolhouse—it had two, ... but the outhouse was way down at the bottom of the hill. Yes, most kids were barefoot and we drank well water from a community dipper. Mom taught three grades. The first, second and third grades each occupied a single row of seats. While two rows were involved in seatwork, Mom gave lessons to the third.

The thought of a computer in that old oiled-floor, white frame tinder box perched on stone columns fairly boogles the mind. To begin with, the nearest electric outlet was about six miles away. Well, I like to think I learned something that first year in school, but the only interactive instruction I can recall came from the tip of a hickory switch. I went the entire year thinking "L-M-N-O-P" was a single word in the middle of the alphabet.

About the only aspect of education that hasn't changed since those days is that squeaking chalk still brings shivers.

In education, *these* are the good, *new* days, so pay attention now; there may be a pop quiz. After all, this is *Rainbow's* education issue. And, the text is a thick one, 324 pages. That means you'll have to read 11 pages a day just to keep from falling behind!

Students, teachers, parents—we have articles and programs for all of you. Need help with a composition? Stephen Tchudi's Write Idea will help you develop ideas for a theme, and Larry Konecky's Bibliography File will help you complete your research. Teachers will want to check out Paul Luetke's grade averaging utility as well as Norman Garrett's random lab scheduler program. Parents should read the commentaries by Steve Blyn, Dale Peterson (Uncle Bert), Dr. Michael Plog and Larry Kheriaty (author of Radio Shack's Pilot, Logo and Game Writer, among other works). Educators, especially, should note Dr. Plog's survey form—which will help him help you with software evaluations.

Music, math, spelling, metric conversion, science drills and even educational games are complemented by a dozen-plus reviews of commercial educational programs. Also, every author, it seems, is on the soapbox with an opinion on "the real purpose of computers in education."

Study hard now, and if you're good, we'll tell you, and show you, all about Radio Shack's very own, just-released 64K machine. We have one and it's a honey, "fawn gray," (bone white) with a trim new style and a new keyboard. Along with the 64K CoCo comes the CoCo 2, a new compact version of the Color Computer. Check out the Pipeline for Editor Lonnie Falk's impressions, then, for another insider's look at all sides of the long-awaited 64K CoCo, read Dan Downard's observations, not only of the hardware itself, but also his preview of what OS-9 can do. (Next month, Dale Puckett, nationally-know expert on OS-9, will begin a monthly column on OS-9!)

Finally, if you've been following Roger Schrag's series on patching *EDTASM*+, this month is icing on the cake—with ice cream on the side. His latest update supports 64K!

Next month graphics, then, in November, the winners of our simulation contest plus a special focus on data communications. But, since this is the education issue, here's a tip in *Economics I*; subscribe to *the Rainbow* while it's still only \$22 a year and you'll get more than 15 pounds of *Rainbow* for less than half the cover price. Let's see, in kilos, that's uh... page 226, isn't it!

-Jim Reed



COLOR AMDISK-III COMPATIBLE.

The AMDISK-III micro-floppy disk system is an engineering breakthrough in disk size, storage capacity, media protection and user convenience. It's fully compatible with your Radio Shack* Color Computer. Enjoy a full 624 KByte† (formatted) storage capability and the extra convenience of the new 3" hard plastic encased diskettes. They fit into a shirt pocket and are easy to mail, too.

The AMDISK-III drive system is ruggedly constructed for years of trouble-free operation, and is backed with our 90 day warranty on parts and labor.

Just circle the reader service number to receive complete specifications.

*Radio Shack is a registered trademark of Tandy Corporation. †Requires recording on both sides.

DEALER INQUIRIES
INVITED

2201 Lively Blvd. • Elk Grove Village, IL 60007 (312) 364-1180 TLX: 25-4786



REGIONAL OFFICES: Calif. (714) 662-3949 • Texas (817) 498-2334

Amdek . . . your guide to innovative computing!

Random Lab Scheduler Utility For Frustrated Teachers

By Norman Garrett

Ost teachers have had, at one time or another, the problem of sector of the students far outnumbered the lah Ost teachers have had, at one time or another, the problem of teaching lab sessions where the students far outnumbered the lab a hranklem of teaching a hranklem class of 34 students with only nine microcomputers available. This presented no the limited Stations. Recently, I faced the problem of teaching a programming microcommutare available. This processed class of 34 students with only nine microcomputers available. I his presented time that was available in a fair manner. I decided to let mv Color Committee do me with quite a scheduling problem. As I pondered how to divide up the limited to let my Color Computer do the work for me with Random Lab Scheduler. Letting the computer do the work solved a couple of problems. First, since accused of involving the Letting the computer do the work solved a couple of problems. First, since schedule to suit the desires of a few students. The assignment system was totally the schedule was created randomly, I couldn't be accused of Juggling the impartial. Second, the printed output allowed me to have a printed schedule

without doing any typing.

schedule to suit the desires of a few students. The assignment system was totally without doing any typing.

Second, the printed output allowed me to have a printed schedule During the design stage, I set down some parameters for the program that and vet incure that some of the neculiar needs of an During the design stage, I set down some parameters for the program that educational setting would be satisfied. First of all, I designed the program so would make it flexible and yet insure that some of the peculiar needs of an the number of alternate selectees could be chosen. This solves the program so educational setting would be satisfied. First of all, I designed the program so of alternate selectees could be chosen. This solves the problem will not he that the number of alternate selectees could be chosen. I his solves the problem wasted. Second, in most educational settings, the teacher must insure that all of absentees among the primary selectees and insures that lab time will not be students are quaranteed a minimum amount of time for lab. If a truly random Wasted. Second, in most educational settings, the teacher must insure that all system were used. Some students would have second or third chances hefore students are guaranteed a minimum amount of time for lab. If a truly random others had any at all. To solve that nrohlem the nropram uses a "decreasing" system were used, some students would have second or third chances before universe" idea such as the logic that is used in program uses a "decreasing when others had any at all. To solve that problem, the program uses a "decreasing the decreasing the logic that is used in programming card games. When universe" idea, such as the logic that is used in programming card games. When universe of available selectees by one. universe of available selectees by one.

(Norman Garrett is an Academic Computing Specialist at Arizona State University and a senior consultant for Software Design Concepts. He holds a master's degree in education.)



Student information consists of last name and first name. Array N\$ is set up for three entries in the second dimension so that a student number or other piece of information could be inserted. The print logic would have to be modified to print such data. The student information is contained in

DATA statements. I suggest that this be modified to accept tape or disk files, thus making the program more flexible and usable for multiple classes. Array N\$ is loaded in lines 600—640. After loading the array, the program asks for user input concerning the lab sessions (lines 680—810). The user will need to supply the following information:

- 1) How many lab sessions will be planned?
- 2) How many work stations are available?
- 3) How many alternates should be selected?
- 4) What is the date of the session?
- 5) What time does the session begin?
- 6) What time does the session end?

Items 2—6 repeat for each session, allowing the user to alter the data between sessions. For example, sometimes I may want to reserve a station for demonstration during only one of four labs. This allows me to do it. Items 4—6 are for the header on the report.

Lines 880—980 test the status of each student in the array. The idea here is to determine whether each student has had a selection opportunity before opening it up to allow subsequent selections. If the number of students who have not yet been selected is less than the number of stations available for this session, a branch is made to a routine which will assign the remainder (lines 1780—1880). Then, to schedule the rest, go to a routine which will randomly select from all possibilities without regard to a previous selection (lines 1590—1650). That routine fills the rest of the quota for the session.

If there are still students to be assigned for the first time, and that number is equal to or exceeds the number of stations available for the current session, a branch is made to the normal selection routine (lines 1690—1740) for the selection process.

Note that the selection logic is such that two flags are available for testing. The Selection Flag indicates that the student has already been selected for this session. This flag allows you to avoid the pitfall of scheduling the same person twice in the same session. The Primary Flag indicates that the student has already been selected one time. This is checked until the condition is met where everyone has been selected once.

After the primary selection process is complete for the session, the alternate selection process takes place (lines 1920—2010). Once all selectees for a session are tabled, the print routine takes place.

The print logic does not include a paging routine. After each session is printed, you must manually set top-of-form before proceeding to the next session. Paging logic to fit your particular printer would be a relatively simple enhancement to make.

Actual uses for this program are many and varied, especially in educational settings. It can be used to schedule oral presentations, speeches, foreign language lab sessions, industrial arts projects, physical education activities or musical presentations. With modification, output could go to

the screen when no printer is available. A screen would have to be formatted and paging logic inserted, neither of which should present major problems.

There is one limitation that you should be aware of: if you inadvertently enter more stations than there are students, an infinite loop will result. The bug could be resolved by an edit routine where the number of stations is input by the user. In reality, though, a situation like that would present a scenario for which this program was not designed.

Hardware Required

16K Color Computer with Extended Color BASIC Printer (DMP-100)

LAB SESSION ROSTER

DATE: 2/28/83 Session Number 1

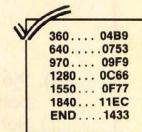
PRIMARY SELECTIONS

- 1. Volckmann, Steven
- 2. Williams, Olive
- 3. Rigoni, Ruby
- 4. Fahey, John
- 5. Soules, Carole
- 6. Wood, Patricia
- 7. Zelinski, Pat
- 8. Kelly, Colleen
- 9. Turnmire, Ruth 10. Koenig, Suzanne
- 11. Rigoni, Herbert
- 12. Lockhart, Edgar
- 13. Moore, Kay

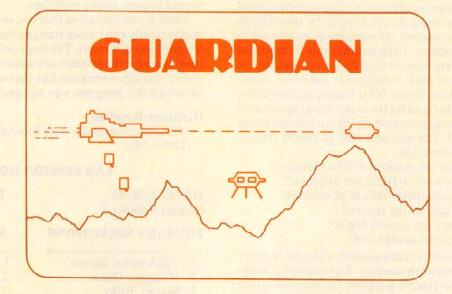
TIME: 7 PM TO 8 PM

ALTERNATES

- 1. Reay, Christie
- 2. Martin, Rosemary
- 3. Armendariz, Myra
- 4. Sims, Lucy



10 ****************	*
20 '* RANDOM LAB SCHEDULER	*
30 '*	*
40 '* BY NORM GARRETT 9/82	*
50 '* COPYRIGHT (C) 1983	*
55 '* SOFTWARE DESIGN CONCEPTS	*
60 '**************	*
70 '	
80 ' ===================================	==
90 ' === VARIABLE LISTING =	==
100 '	-
110 '	
120 ' N\$ (40,3) NAME TABLE	(Ø
-40)	
130 ' Ø NOT USED	
140 ' Ø NOT USED	
150 ' 2 FIRST NAM	E
160 ' R RECORD COUN	T
170 'S # STATIONS	
180 'SS # SESSIONS	
190 ' A # ALTERNATE	S
200 'SC SESSION COU	NT
ER	



You've played "DEFENDER" at the arcade, but you've only seen the "attempted copies" for your Color Computer!

Now get the real thing!

Check these features:

- 1). The Landers aren't suddenly just "there", they implode out of particles!
- 2.) Not just "Beeps" but stunning sounds!
- 3.) Explosions just like the arcade with no skimping!
- 4.) Thrust flame behind your ship.

... and many more!

Order now by check, M.O., C.O.D., or see your dealer... (If he doesn't have it yet, send him to us!)

\$27.95 — Tape / \$29.95 — Disk

Add \$1.50 per order for postage and handling. California residents add 6%.



21Ø 'N(4Ø,2)	RECORD TABLE
220 ' Ø	SELECT FLAG
230 ' 1	PRIMARY FLA
G	
24Ø ' AT\$(2Ø,2)	ALTERNATE SEL
ECTIONS	
25Ø ' Ø	LAST NAME
260 ' 1	FIRST NAME
27Ø ' PT\$(20,2)	PRIMARY SELEC
TIONS	
28Ø ' Ø	LAST NAME
290 ' 1	FIRST NAME
300 ' X,Y,Z,C1-C5	NUMERIC WORK
FIELDS	
31Ø ' D\$	DATE
32Ø ' S1\$	START TIME
33Ø ' S2\$	STOP TIME
34Ø ' PF\$	PRIMARY FIRST
NAME	
350 ' PL\$	PRIMARY LAST
NAME	
360 ' AF\$	ALTERNATE FIR
ST NAME	
37Ø ' AL\$	ALTERNATE LAS
T NAME	
380 ' AN\$	ALTERNATE NUM
BER	
390 ' AP\$	LITERAL ". "
4ØØ ' AA\$	LITERAL ", "

N	10)	R	T	H	1	N	E	S	D	A	T	A

15% to 20% OFF

		NOM JUSI:
Donkey King	TM	\$21.20
Colorpede	Int	\$25.45
Astro Blast	MD	\$19.96
Doodle Bug	CW	\$19,96
Space Race	Sp	\$18.65
Planet Invasion	Sp	\$18.65
Pacdroids	PG	\$15.96
Starfire	Int	\$18.65
Haywire	MD	\$19.96
110, 1110	* *	

PRINTERS

GEMINI 10 \$339.95 Serial Card for GEMINI \$74.95

Special prices in our news letter that only our customers will know about!!

Write or call for catalog.

NORTH WEST DATA

P. O. Box 7175 Spokane, Wa. 99207-0175 (509) 489-5133

Add 5% for postage and handling Add \$3.00 for C.O.D. orders No C.O.D. on PRINTERS

41Ø ' AC	ALTERNATE COU
NTER	
420 ' PC	PRIMARY COUNT
ER	
430 '	
440 '	
450 '	
460 ' INITIAL	IZATION
47Ø '	
48Ø DIM N\$(4Ø,2):D	IM N(40,2):R=0
: S=Ø	
49Ø DIM AT\$(20,2)	
500 DIM PT\$(20,2)	
510 POKE 149,0:POK	
52Ø SS=Ø:A=Ø:SC=Ø:	X=Ø:Y=Ø:Z=Ø:AC
=Ø:PC=Ø	
530 FOR X=0 TO 30	
54Ø FOR Y=Ø TO 2	
55Ø N(X,Y)=Ø	
560 NEXT Y:NEXT X	
562 CLS:PRINT "PRE	SS ANY KEY TO
RANDOMIZE"	
564 AS=INKEYS: X=RN	ID(Ø):IF A\$=""
THEN 564	
57Ø '	
58Ø ' READ DA	TA INTO NS ARR
AY	
59Ø '	
LAA EOD V=1 TO SA	



610 READ N\$ (X.1) 620 IF N\$(X,1)="XXXXX" THEN 650 630 READ N\$(X,2):R=R+1 64Ø NEXT X 65Ø ' 660 ' ---- INPUT RUN DATA ----67Ø ' 680 CLS:PRINT@8,"* LAB PLANNER * 69Ø PRINT@4Ø, "----" 700 PRINT@96, "HOW MANY SESSIONS" :: INPUT SS 710 PRINT@160, "HOW MANY WORK STA TIONS":: INPUT S 720 PRINT@224, "HOW MANY ALTERNAT ES";: INPUT A 73Ø SC=SC+1:GOSUB 132Ø 740 IF SC > SS THEN 1090 750 CLS: INPUT "SESSION DATE"; D\$ 760 PRINT: INPUT "SESSION START T IME" : S1\$ 770 PRINT: INPUT "SESSION STOP TI ME"; S2\$ 78Ø PRINT: PRINT "SET TO TOP OF F ORM" 79Ø PRINT" THEN PRESS (ENTER)" 800 INPUT A\$ 810 GOSUB 1110

82Ø ? 830 ' 84Ø ' ---- CHECK STATUS & SELECT 85Ø ' 860 ' << HAS EVERYONE HAD A PRIM ARY CHANCE? >> 87Ø 88Ø Z=Ø 890 FOR X=1 TO R 900 IF N(X,1)=1 THEN 920 910 Z=Z+1 92Ø NEXT X 93Ø IF Z<>Ø THEN 95Ø 94Ø QQ=1:GOTO 156Ø 950 IF Z<S THEN 1750 960 FOR C1=1 TO S 97Ø GOSUB 166Ø 98Ø NEXT C1 990 ' 1000 ' << SELECT ALTERNATES >> 1010 ' 1020 GOSUB 1890 1030 GOSUB 2020 1040 PC=0:AC=0:IF (SC+1) > SS TH EN 1090 1050 CLS:PRINT@96, "SESSION NUMBE R ";(SC+1)

DATABASE / MAILER - 'CC-DBM' \$49.95 LETTER WRITER -'CC - LW' \$39.95

with the introductory offer - FREE! CC-LW purchase of CC-DBM

Database/Mailer "CC - DBM"

16K or 32K

- Simple to use even for the novice
- Active Main Menu guides user to valid operations.
- 32K disk (or tape) approx.59, (61) to 338, (351) records.
- 16K disk (or tape) approx. 12, (15) to 72, (86) records.
- 4 to 10 fields, 5 to 27 widths, 20 to 270 char./record.
- All user definable with default values for ease of use.
- Automatic memory sense adjusts to the size of your system.
- Fast Basic sort by any field with "Percent Sorted" display.
- Automatically adjusts for empty address lines no gaps.
- Print up to 9 line labels on envelopes or mailing labels.
- Optional special printer codes for customized labels.
- Master printout with 2 column format including field name.
- Automatically prints header with date, paging and filename.
- Works with any printer, use friction or tractor feed.
- Selective printing by any field or field range.
- Optional multiple copies of mailing labels.
- Single screen 10 record display by user defined field.
- Single key entry provides hard copy of screen data.
- Comprehensive 25 page users manual with flow diagrams.
- Includes detailed instructions for user modification.
- ★ Compatible with CC-LW for mail-merge, form letters, etc.

Letter Writer "CC - LW"

16K or 32K

- Much easier to use than a 'word processor.'
- Allows fast single page letter writing.
- Embedded commands for centering, multiple line skip, tabbing and wordwrap
- 16K or 32K tape or disk.
- Edit mode allows you to delete or insert text.
- ★ Uses CC-DBM data files for form letter capability.
- Works with any printer and standard paper.
- Excellent users manual.

CC - DBM 16K, 32K disk or tape CC - LW 16K, 32K disk or tape PLEASE SPECIFY TAPE OR DISK - \$49.95

\$39.95



To order, send check or money order to:

EVS Engineering

9528 Suite 35, Miramar Road San Diego, CA 92126

Include \$2 postage & handling. U.S. Dollars only,

Or check your local software dealer. For questions, credit card orders, call (619) 566-6013 or (619) 695-1385 on weekdays 8 A.M. to 4 P.M. PST. We will be glad to help. Dealer inquiries invited.

California residents please add sales tax - 6%.

Allow 2 weeks for personal checks. No Cash, No C.O.D.s

```
1270 ' ---- PRINT DETAIL ROUTINE
1060 GOTO 710
1Ø7Ø '
                                        128Ø '
1080 ' ---- END PROGRAM ----
1090 '
                                        1290 PRINT#-2, TAB(8)C1;". ";PL$;
1100 END
                                        ", ";PF$;
1110 '
                                        1300 PRINT#-2, TAB(51) AN$; AP$; AL$
1120 ' ---- PRINT HEADER ROUTINE
                                        ; AA$; AF$
                                        1310 RETURN
                                        1320 '
113Ø '
1140 PRINT#-2," ":PRINT#-2," "
                                        1330 ' ---- INITIALIZE SELECT FL
                                        AGS ----
1150 PRINT#-2, TAB(31) "LAB SESSIO
                                        1340 '
N ROSTER"
                                        1350 FOR X=1 TO R
1160 PRINT#-2," "
                                        1360 \text{ N(X,0)} = 0
1170 PRINT#-2, TAB(8) "DATE: ";D$
                                        137Ø NEXT X
118Ø PRINT#-2, TAB(56) "TIME: ";S1
$!" TO ":S2$
                                        138Ø RETURN
                                        1390 '
1190 PRINT#-2, TAB(8) "SESSION NUM
                                        1400 '
BER ";SC
1200 PRINT#-2," "
                                        1410 ******** D A T A *****
1210 PRINT#-2, TAB(11) "PRIMARY SE
                                        ***
                                        1420 '
LECTIONS":
                                        143Ø '
1220 PRINT#-2, TAB (54) "ALTERNATES
                                        1440 DATA ARMANDARIZ, MYRA, ARMSTR
                                        ONG, AUDREY, BAUER, BARBARA
123Ø PRINT#-2, TAB(1Ø)"-----
1450 DATA BROWN, DANNETTE, BROWN, T
                                        HOMAS, BURR, MARILYNN
124Ø PRINT#-2, TAB(53)"-----
                                        1460 DATA CASSIDY, KAY, CONIAN, SHE
                                        RRY, COOK, PATRICIA
125Ø RETURN
                                        1470 DATA DAVIS, JANE, EVANS, JOAN,
1260 '
```

for 13" TV



\$25.50 TS-1 15W x 11D x 4H

MONITOR (TV) STANDS

for 19" TV



\$35.50 TS-4 24W x 11D x 4H

- ventilator holes
- slot for ROM pack

Colors available: ivory, smoked gray deduct \$1.00/stand for clear

1 Year guarantee on plastic and workmanship. Stand may be returned within 30 days for refund if not satisfied.



Howard Medical Company

Box 2 Chicago, Illinois 60690

for printers



\$19.95 PS-1 15W x 11D x 4H \$22.50 PS-2 same as above with slot for bottom feed printers

~		owing stands	
Cat #	Quan.	Color	Price
		<u></u>	
	S	hipping	
	IL Residents	Add 6%	
		Total	
Name			***
City/State			
Zip			

GOLLIHARE, WILLIAM 1480 DATA HENDRIX, WARD, HEYMAN, KA THY, JUDGE, CATHY 1490 DATA KOENIG, SUE, MACY, KARLA, MARTIN, ROSEMARY, MASON, RIC, MATECK I, GRACE 1500 DATA MCCARTHY, THOMAS, MENDOZ A, HENRY, MROSKI, MELODY 1510 DATA NASH, LOIS, NELSON, DEBBY , NELSON, MARK 1520 DATA SANDERS, CHARLES, SATTER FIELD, CRAIG, SATTERFIELD, JANET 1530 DATA SCIOTTA, KATHY, STAUBER, MARIE, THORLEY, EDMUND 1540 DATA ZELINSKI, PAT, MARTIN, MA RIANNE 1550 DATA XXXXX 156Ø ' 1570 ' ---- EVERYBODY IS ELIGIBL E FOR PRIMARY SELECTION ----158Ø ' 1590 FOR C2=QQ TO S 1600 SL=RND(R) 1610 IF N(SL,0)=1 THEN 1600 162Ø PT\$(C2,Ø)=N\$(SL,1):PT\$(C2,1)=N\$(SL,2)1630 N(SL, 0) = 1 : N(SL, 1) = 1164Ø NEXT C2

PAY WHAT YOU WANT

for home and business software RS CoCo and TDP-100

> 16/32K Disk or Cassette Extended Color Basic Required

BUDGET RECORD

Income & outlay by 99 categories. Great for taxes. 32k.

MAILING LIST

Makes labels, printouts and alphabetized lists. M/L sort.

APPOINTMENT BOOK

Print a calendar with any number of memos/day. (32k. Requires printer with compressed characters)

GRADE BOOK

Make rolls & grade sheets, complete with stats and totals.

ALSO AVAILABLE

Phone Book, Sales Record, Car Repairs, Diet Delight, Grocery List.

The Fine Print:

Order two programs maximum. Send shipping/handling in advance (1—\$4.00; 2—\$6.00). After using the program, pay only what the program is worth to you. Let's try applying right livelihood to the software industry!

Specify 16/32K and type of printer.

Bruck Associates 6609 Westmoreland Ave. Takoma Park, MD 20912 (301) 270-5822



Free catalogue on request

```
1650 GOTO 1020
1660 '
1670 ' ---- NORMAL PRIMARY SELEC
TIONS ----
1680 '
169Ø SL=RND(R)
1700 IF N(SL,0)=1 THEN 1690
171Ø IF N(SL,1)=1 THEN 169Ø
172Ø PT$(C1,Ø)=N$(SL,1):PT$(C1,1
)=N$(SL,2)
1730 \text{ N(SL,0)}=1:\text{N(SL,1)}=1
174Ø RETURN
175Ø ?
1760 ' ---- SCHEDULE REMAINDER -
177Ø '
178Ø C3=1
179Ø FOR C5=1 TO S
1800 IF N(C3,0)=1 THEN 1850
1810 IF N(C3,1)=1 THEN 1850
182Ø PT$(C5,Ø)=N$(C3,1):PT$(C5,1
)=N$(C3,2):N(C3,\emptyset)=1:N(C3,1)=1
1830 C3=C3+1:IF C3 > R THEN 1870
1840 NEXT C5:GOTO 1020
1850 C3=C3+1:IF C3 > R THEN 1880
1860 GOTO 1800
187Ø QQ=C5+1:GOTO 156Ø
188Ø QQ=C5:GOTO 156Ø
189Ø '
1900 ' ---- SELECT ALTERNATES --
1910 '
1920 FOR C1=1 TO 20
1930 AT$(C1.0)=" ":AT$(C1.1)=" "
1940 NEXT C1
195Ø FOR C1=1 TO A
1960 SL=RND(R)
1970 IF N(SL,0)=1 THEN 1960
198Ø AT$(C1,Ø)=N$(SL,1):AT$(C1,1
)=N$(SL,2)
1990 N(SL, \emptyset) = 1
2000 NEXT C1
2010 RETURN
2020 '
2030 ' ---- SET UP DETAIL ROUTIN
E ----
2040 '
2050 FOR C1=1 TO S
2060 PRINT#-2," "
2070 PL$=PT$(C1,0):PF$=PT$(C1,1)
2080 IF C1 > A THEN 2110
2090 AN$=STR$(C1):AP$=". ":AL$=A
T$(C1,Ø):AA$=", ":AF$=AT$(C1,1)
2100 GOTO 2120
211Ø AN$=" ":AP$=" ":AL$=" ":AA$
=" ":AF$=" "
212Ø GOSUB 126Ø
2130 NEXT C1
2140 RETURN
```



COLORSOFT™ BUSINESS SOFTWARE

AT LAST! BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER

- ★ MAKE YOUR COLOR COMPUTER A WORKING BUSINESS PARTNER ★
 - ★ ALL PROGRAMS ARE MENU DRIVEN AND USER FRIENDLY ★
 - ★ PROFESSIONALLY WRITTEN AND FULLY TESTED ★
 - * AFTER-THE-SALE SUPPORT *

COLORSOFTtm GENERAL LEDGER

COLORSOFT Im General Ledger is ideal for the small business man who wants to take advantage of the time saving benefits of computerized accounting procedures. This package is designed for the businessman who is knowledgable of accounting principles and who wants a computerized accounting system with greater user control. The features and options of this package compare favorably to higher priced software.

FEATURES

"" USER FRIENDLY AND FULLY MENU DRIVEN ""

"" USER FRIENDLY AND FULLY MENU DRIVEN ""

"" UP TO % USER DEFINABLE RECORD CATEGORIES ""

"" USER FLEXIBILITY IN ACCOUNT DESIGN AND ENTRIES ""

"" DETAILED USER'S MANUAL WITH SAMPLE TRANSACTIONS ""

"APPROXIMATELY 800 ACCOUNTS RECEIVABLE/PAYABLE FILES ""

""STYLED FOR THE ACCOUNTANT/BOOKKEEPING ORIENTED USER ""

"" MENU PROMPTS MAKE ENTRIES EASY, FAST, AND EFFICIENT ""

COLORSOFT IM General Ledger is an integrated, journal-type double entry accounting package for a small business that includes General Ledger, Accounts Payable, and Accounts Receivable programs. Outputs of the system include an income statement, balance sheet, accounts payable and receivable status lists, accounts payable and receivable status lists, accounts payable and receivable accounts of up to \$1.000.000.00 for approximately 800 accounts payable/receivable. Accounts are automatically numbered and each transaction is carried separately so that an account number will correspond to a specific purchase rather than a specific vendor/customer.

Requires 16K and a Single Disk Drive. PRICE: \$129.95

COLORSOFTtm SMALL BUSINESS ACCOUNTING

The COLORSOFT tm Small Business Accounting package is ideal for the small businessman who wants to take advantage of the time saving benefits of computerized accounting procedures. This package is designed with this person in mind and as such, extensive computer or accounting experience is not required. The feature and options of this package are comparable to much higher priced software.

FEATURES

"USER FRIENDLY AND FULLY MENU DRIVEN "
"USER DOES NOT NEED TO BE AN ACCOUNTANT "
"UP TO 32 USER DEFINABLE RECORD CATEGORIES "
"DETAILED USER'S MANUAL WITH SAMPLE TRANSACTIONS "
USER IS PROMPTED FOR COMPANION ENTRIES AS REQUIRED "
"APPROXIMATELY 800 ACCOUNTS RECEIVABLE/PAYABLE FILES "
MENU PROMPTS MAKE ENTRIES EASY, FAST, AND EFFICIENT "

"MENU PROMPTS MAKE ENTRIES EASY, FAST, AND EFFICIENT"
COLORSOFT Im Small Business Accounting is an integrated, ledgerless accounting package for a small business that includes Accounts Payable, Accounts Receivable, Sales, and Purchase Order programs. Outputs of the system include an income statement, balance sheet, check register, accounts payable and receivable situs lists, and accounts payable and receivable aging reports. During each user established accounting period (monthly, quarterly, annually, etc.), it will handle sales of up to \$1,000,000.00 and approximately 800 accounts payable/receivable. Accounts are automatically numbered and each transaction is carried separately such that an account number will correspond to a specific purchase rather than a specific vendor/customer. vendor/customer.

Requires 16K and a Single Disk Drive. PRICE: \$149.95

COLORSOFT" PAYROLL

The COLORSOFT ^{Im} Payroll is a stand-alone payroll system. It is also sulted for integration into the COLORSOFT ^{Im} Small Business Accounting Package. Payroll is a highly user friendly system designed for regular use by the small businessman.

FEATURES

*** SUPPORTS OVERTIME AND BONUS PAY *** ... USER FRIENDLY AND FULLY MENU DRIVEN ... " HANDLES HOURLY AND SALARIED EMPLOYEES " " MAINTAINS YEAR TO DATE TOTALS PER EMPLOYEE "

" HANDLES FEDERAL. STATE, AND LOCAL INCOME TAXES " *** DETAILED USER'S MANUAL WITH SAMPLE TRANSACTIONS *** *** HANDLES OVER 200 EMPLOYEES WITH 8 DEDUCTIONS EACH ***

*** MENU PROMPTS MAKE ENTRIES EASY, FAST, AND EFFICIENT ***

COLORSOFT " Payroll is a complete stand-alone package for maintaining personnel and payroll data on the employees of a small business and for calculating payroll and tax amounts and maintaining year-to-date totals for income tax reporting. This system will compute each pay period's totals based on hours worked, calculate taxes to be withheld, allow for specified deductions, compute net pay and prepare a mailing list. Additional reports that are produced include a listing of employees, a year to date federal and/or state tax listing, and a listing of current miscellaneous deductions. This system is suited for use in all states except Oklahoma and Delaware.

Requires 16K and a Single Disk Drive. PRICE: \$99.95

COLORSOFTtm ACCOUNTS RECEIVABLE

COLORSOFT tm Accounts Receivable is a full stand-alone accounts receivable system. It is also suited for integration into the COLORSOFT tm Small Business Accounting package. Accounts Receivable does not require the user to be an accountant; in fact, this is a highly user friendly system designed for dally use by the small businessman. The features and options of this system compare favorably with much higher priced software.

FEATURES

*** PROVIDES ACCOUNT AUDIT TRAIL *** "ACCOUNTS ARE CARRIED BY CUSTOMER "
"USER FRIENDLY AND FULLY MENU DRIVEN "
"PREPARES INVOICES AND MAILING LABELS "
"USER DOES NOT NEED TO BE AN ACCOUNTANT "

*** DETAILED USER'S MANUAL WITH SAMPLE TRANSACTIONS *** *** MENU PROMPTS MAKE ENTRIES EASY, FAST, AND EFFICIENT ***

COLORSOFT tm Accounts Receivable provides the user with detailed audit trails and history files on all transactions by a customer. It also prepares involces, mailing labels, aging lists, customer history reports, and an alphabetized customer listing. The user can define discount/net terms for commercial accounts and finance charge and minimum payments for revolving accounts.

Requires 16K and a Single Disk Drive. PRICE: \$89.95

USER'S MANUALS WITHOUT PROGRAM \$20.00 EACH (Refunded on Purchase) INCLUDE: \$2.25 Handling Per Order WRITE FOR FREE CATALOG

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP P.O. BOX 1708, DEPT. R **GREENVILLE, TEXAS 75401**



TELEPHONE ORDERS (214) 454-3674 COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

COLORSOFT " APPLICATIONS SOFTWARE

COLORSOFTtm MANAGEMENT SKILLS SERIES I: BEING BOSS

Annual Company of the Company of the

BEING BOSS" is a collection of six programs and is the first in an ongoing series of computer assisted management development tools. Those who can benefit include corporate executives, managers, heads of teams, group leaders, supervisors, foremais, teachers, and parents. In fact, anyone who must take a leadership role can benefit from these programs.

- A. REFLECTIONS a self evaluation guide
 B. ASSERTIVENESS taking control as a leader
 C. MANAGEMENT STYLES how to approach the leadership role
 D. DECISION MAKING how to handle decision making
 E. COUNSELING helping others solve personal problems
 F. STRESS CONTROL taking care of yourself

Each program is in a multiple choice questionnaire format where the user is querried as to a response to a specified management situation. Tutorials help the user learn new management skills and insights. The programs include voice annotation from the author, Mr. Terry Barker. "BEING BOSS" is based in part on his forthcoming management books "BOSS TALK" and "THEORY C."

The series, "BEING BOSS", offers to the user the latest in management skill development concepts and should prove to be an invaluable TOOL for anyone who wishes to reach their full potential as a leader. The author has condensed week long intensive workshop material into this outstanding package. The accompanying user's manual is very well written and is easily understood by anyone anyone.

> Requires 16K Ext BASIC and cassette. **PRICE \$89.95**

Management of the Committee of the Commi

LOAN ANALYSIS . . . Prints amortization tables, determines status of loans, and auto loan option with trade-in allowance and taxes ... \$ 20.95

And the state of t

ANNUITY . . . Future value, present value, compound interest, and determines Individual Retirement Accounts (IRA)

16K Ext BASIC \$ 18.95

STOCK ANALYZER . . . Maintains stock portfolio data base for multiple stocks. Graphs to screen or printer and projects trends of data. Disk 16K Ext BASIC \$ 21.95

RECIPE FILE . . . Save your recipes on tape. Features include built-in text editor for creating and editing each recipe and adjusts ingredient measure for desired servings. Screen or Printer output 16K Ext BASIC \$ 21.95

HOUSEHOLD EXPENSE MANAGER . . . Menu driven package for maintaining cassette file of 30 household expenses for a 12 month period. Keeps cumulative totals by category and a separate total for tax deductible expenses. Analysis program compares month to month. Screen or

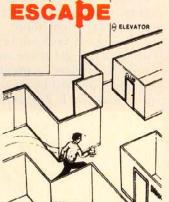
Annumentum de la company de la

COLORSOFT " GAMES



Classic two player game of chase - fun for all ages.

16K BASIC with joysticks



A 3-D Graphics Adventure designed for the thinker. 8-10 hour game time.

> 16K BASIC \$18.95



An excellent version of the Othello type board games. 1 or 2 players.

16K Ext. BASIC

Pirate Treasure



Beginners Adventure. Visit over 40 rooms in search of the Pirate's treasure.

> 16K Ext. BASIC \$13.95



HALLOWEEN SPECIAL: The Great Pumpkin Adventure Designed for kids who will love searching for tricks 'n' treasures while they try to learn the Great Pumpkin's secret. This adventure is great for Halloween parties, family play, or single players. This program features an action game at the Goblin

16K Ext. BASIC with joysticks \$18.95

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.

Gulch arcade.

P. O. Box 1708 Greenville, Texas 75401



TELEPHONE ORDERS (214) 454-3674 COD/VISA/MASTERCARD

Include \$2.25 Handling per order Write for Free Catalog

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

Copyrighting Your Software Part 1

By Tom Nelson Rainbow Contributing Editor

ou've seen it so many times: Copyright @ 1983 by E. Z. Pickler, ALL RIGHTS RESERVED, blah, blah, blah. Everytime you open the front cover of a book, plug in your computer or load a piece of software that same "©" symbol pops out at you. The reason is simple—this symbol is part of the shield given to authors, and so authors will almost always use it.

As a software author you will need to understand copyright principles since an understanding of the fundamentals of copyright law is essential to a proper understanding of one basic means to protect your software. The principles of copyright law also form the framework for nearly every contract dealing with software. So just what is a copyright?

Copyright is the special form of protection provided to authors by the United States government. Copyrights were contemplated in the Constitution, which allows Congress to pass laws to aid in the promotion of literary works. It is purely federal law, governed by a federal statute and rules promulgated under that statute.

Copyright law has a long history which is of little immediate interest to anyone but lawyers. This is because in 1976 a new copyright law was enacted which superseded the old law. This new law significantly improved the old 1909 law which plainly was not well suited to the new technologies. In fact, in 1981 a special amendment came into effect which covers the copyright of computer software. Now computer software is explicitly recognized by copyright law and all is well and good. (Well, we'll see about that.)

This new amendment will be dealt with below, but first the basics. The copyright law is contained in Title 17 of a compendium of all federal statutes called the United States Code (abbreviated "U.S.C."). It covers sections 101 through 509. The statute is administered by the Patent, Trademark and Copyright Office in Washington D.C. The Copyright Office has the power to promulgate rules interpreting the copyright

statute and to set policies for registration requirements. A set of regulations governing copyright matters is contained in Title 37 of the Code of Federal Regulations, the compendium of rules issued by federal agencies. A copy of the copyright statute and its regulations should be available in larger libraries.

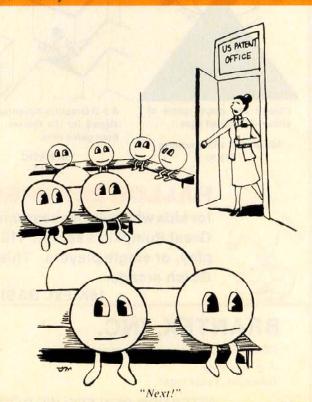
Copyright law is designed to cover works of authorship. Since computer programs are works of authorship they are covered by copyright law. Computer programs are defined

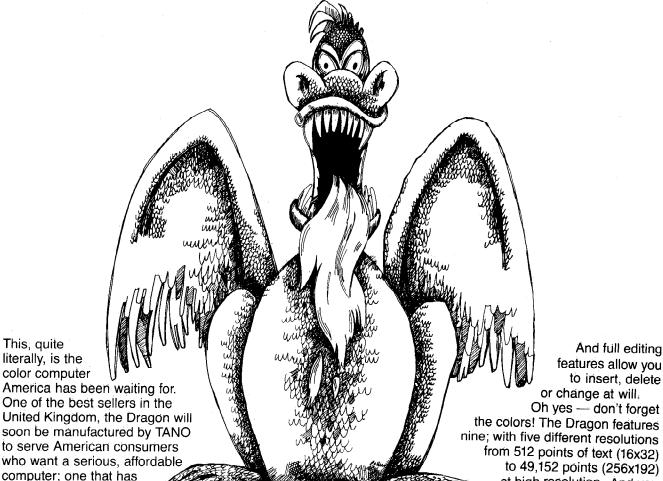
(Tom Nelson was formerly a Special Assistant Attorney General for the State of Minnesota. He currently is General Counsel for Softlaw Corporation, makers of the Super "Color" Library.)

by section 106 of the statute as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." This definition is broad enough to include just about any computer program. Copyright law is devoted to clarifying copyright owner rights, the mechanics of transfer of those rights, methods to obtain those rights and methods to enforce the rights.

Unlike under the old law, a copyright exists in a work from the moment it is created. A work doesn't have to be registered to be protected by copyright laws, but for the copyright protection to remain in force, the work cannot be "published" without a proper copyright notice. "Publish" has a technical meaning. It includes selling the work, or even lending it to a friend. Thus, you should be careful to include a proper copyright notice at the beginning of your programs. In fact, the first line of code in every program should be your copyright notice.

Now that I have you here I might as well tell you what a proper copyright notice consists of. It should start with the word "Copyright" or the abbreviation "Copr.," then the "®" symbol, followed by the year of creation, then the attribution, here, "by E. Z. Pickler." The full notice would then be:





management applications as professional typewriter-style

Using the new 6809E Microprocessor (a great advance on the original 6502 still used by our competition), the Dragon brings advanced computer functions well within your reach. And priced below \$400, it's anything but expensive.

But these aren't the only points of difference with which our Dragon roars. Unlike most units, the Dragon gives Extended Microsoft™* Color BASIC as its standard language while the competition is still stuck in Microsoft™* BASIC training. The Dragon's advanced graphics features include set, line, draw, circle, paint, print @ and print using. Of course the Dragon also features advanced sound capabilities.

*Microsoft™ is a registered trademark of Microsoft Corp.

This, quite

proven itself at providing

well as fun and games. To

meet this challenge, the

Dragon was born. With a

standard 64K of RAM. A

keyboard guaranteed for

20 million key operations.

And an impressive array

of options which include

disk controller and

drive, a printer, audio

modem (RS-232 serial

BASIC training manual.

cassette recorder, a

I/O), joysticks, game

cartridges and a free

educational and home

at high resolution. And you can view these amazing phenomena through either your composite video color monitor or VHF TV. So goes the Dragon's story. If you'd like to know more, just mail the coupon or call George Merchant (our Director of Marketing) toll free at 1-800-327-7671 Software developers and dealer inquiries are welcome. The Dragon is destined to become legend as America discovers its great performance is no myth.

And full editing

to insert, delete

Please send me more informa	<u> </u>
COMPANY	· -
ADDRESS	
CITY	STATE
ZIP PHONE	
4301 Poche Court West New Orleans, LA 70129	MICROCCOMPUTER PRODUCT'S CORP

"Copyright © 1983 by E. Z. Pickler." This form may be shortened to eliminate the word "Copyright," but the "©" symbol, the date and the attribution must be there. Just to add a little fun, you have to be careful about how the copyright notice is written if you are marketing your product in international markets. The requirements vary with the country, and are often dictated by international copyright conventions subscribed to by a large number of countries. Cross that bridge when you have to. If you need some immediate advice, however, contact a copyright attorney to check on your particular problem.

As I said, your program does not have to be registered with the Copyright Office in order for you to benefit from the protection of the copyright laws. So why register? Because some of the protections afforded by the copyright laws will not apply unless you register. In particular, you cannot obtain attorney's fees and court costs for violations which occur after the first 90 days subsequent to first publication of the program unless you register. This is *very* important, since often attorney's fees can be so great that they actually prohibit you from bringing any action unless you can count on being reimbursed when (and if) you win.

Before you rush out and register your copyright for that program, you'd better consider whether you want copyright protection at all. That's right. It is entirely possible that you may decide that copyright protection is not exactly what you want for your program. Although I do not feel it wise for anyone to make that decision before consulting an attorney who specializes in intellectual property law, you should at least have an idea of the basic consideration involved in the decision.

Copyright protection is just one means to protect your software creation. Another popular legal shield is trade secret protection. Trade secret protection is afforded those who keep a piece of information secret. It provides a remedy against the unauthorized disclosure of trade secrets. I will discuss this topic later. Here, suffice it to say that the essential element of trade secret protection is total unavailability of your program to the public. Copyright law is almost the antithesis of this concept. When you copyright a piece of software you are usually selling the object code to the public. This is making your program public. In fact, if you register your program with the Copyright Office, this is arguably a publication of your program to the public. How can anything explicitly made public be considered a trade secret?

Many authorities feel that if the source code, your assembly language program, is kept secret, copyright of the object code alone is not sufficient to destroy trade secret protection for your program since object code is not directly translatable into your precise source code. Like other areas of copyright law in relation to computer software, this thesis is untested, and you should weigh carefully the factors in deciding whether to register your copyright in your program. If trade secret protection is more important to you than copyright protection, perhaps you will not wish to register your copyright in the program, but instead will rely on the trade secret protection provided by the laws of your state. Again, you will want to consult with you attorney before making a final decision.

Actual registration requirements will be left to next month's column. Here let's discuss a bit more what the copyright laws will and will not do for you.



CIRCLE CITY SOFTWARE

NEW ADDRESS: 1210 Victoria Drive Lebanon, Indiana 46052



Credit Card Customers include number and expiration date.

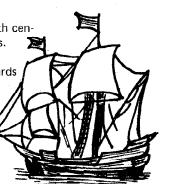


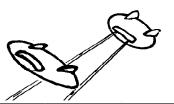
SEA TRADER

A new game in which you play an 18th century sea captain plying the trade routes. The you start start out on a shoestring and try to become a billionaire. Hazzards include pirates, storms, bad markets, and bad debts. People have become so fascinated with this game that they actually cheat to keep from winning. 16K color basic, tape or disk \$19.95.



Take a trek through space to defeat the alien enemy in this superior version of a classic space game! Reviewed in Rainbow. Requires extended basic. Comes with 32K 3-level game or 16K novice version. Tape or disk \$19.95.





NEW MASTER DISK

\$29.95

A touch of a button allows you to keep tabs on your disk library. Creates directory files directly from 100 of your source disks on one Master Disk. Search by file name, file type, disk name, free space, or individual directory. All output can be sent to line printer. Menu driven and very user friendly! This is an improved version of the program reviewed in The Rainbow. Optional accessory package adds even more features. 16K or 32K disk required.

ACCESSORY PACKAGE

\$20.00

A second disk for improved versions of the original single-disk accessory programs. Includes notebook for storage of disks and paperwork.

SORT

New Sort program is faster and more efficient than original version. Runs in 16 or 32K to produce an alphabetic listing of all file types you specify.

RECOVER

New Recover program not only rewrites directories from master files but can rebuild an entire disk to eliminate "IO" errors.

ZAP

New addition. User friendly directory Zapper to manually correct directory data when all else fails. Menu-driven with help files for novices.

Copyright protection protects the actual expression of ideas, but not the ideas themselves. This is a crucial distinction, especially with games. An idea is a concept or a generalized schema relating to a specific topic. The expression of an idea is just that; your particular manifestation of the idea.

This distinction can be shown best with the so-called "maze-chase" games. There are many maze-chase games of the Pac Man[™] variety in which some beasty chases a gobbling good guy which innocently is munching some goody or other. The good guy can eat a power pill or the like to be able to eat the beasty, and so on and so forth. We've all played this one a thousand times. What I have just described is the idea of a game, a concept. This concept is not copyrightable. If it were, the first to think of it could unfairly corner the market on an idea, stopping others from using it in any way in the future.

Copyright law was not designed to provide this protection; patent law was. Patent law, however, does not apply to this kind of application software. (This will be discussed to some extent in a later column.) Instead, copyright law was designed to protect an author's particular expression of the idea. Thus, courts have devoted much effort to determine what is the expression in each particular case, and whether there has been an infringement of that expression. I will tell you the saga of Pac Man[™] in a later column to show just how the courts have dealt with the "knock off" problem in the software area.

By now you are beginning to get a feeling that copyright law may not be very clean cut and simple. In the computer software area, an especially new and complex area, this feeling is well founded. Copyright law was not well designed for computer software which is a hybrid kind of intellectual property. Software is too new, too novel even for the new 1976 and 1981 additions to the copyright law.

Copyright law for software grew out of software for huge mainframes. No thought has been devoted to the special problems inherent in microcomputer software which is increasingly taking a larger market share, and there are real, different problems. Mainframe software was and is designed to be user modifiable. Customization is presumed. Customization of microcomputer software is not presumed; quite the opposite is true. It is assumed that the user will find the offered software totally sufficient for his or her needs. If this is not true, another piece of software is sought and bought. Since microcomputer software is relatively cheap, this has become the standard business practice.

Thus, copyright laws designed for mainframes cannot hope to be directly applicable to microcomputers. Yet, the copyright laws have not changed. There is much growing to be done in the next few years in the software industry and in the laws relating to the protection of software. You, as an author, can play a significant part in that growth. You can help to shape the software and the laws of the future to make your efforts ever more rewarding and profitable.

In my next column I will discuss the steps for registering the copyrights for your programs. In the following months I will discuss more about how the copyright laws work to define the author-publisher relationship. For those of you who can't wait, try to find the work The Copyright Kit: How to Copyright Your Computer Software by Noel D. Adler and Steven A. Novani, National Attorneys' Publications, Inc., 1981. Until then, good computing.

RECOGNITION

For your 16K TRS-80 Extended Basic Color Computer

By Cary D. Perttunen

Using your cassette recorder's condenser microphone, the COLOR TALK TO ME software package can let you use your own voice as an alternate means of input for any of your BASIC programs. Over 200 words can be stored in 16K RAM. With a little practice, you can attain from 80% to over 90% accuracy for most applications.

The COLOR TALK TO ME Software Package includes:

-COLOR TALK TO ME machine language subroutine -The BASIC subroutine which can merge COLOR TALK TO ME with your programs -Complete instructions on how to use and incorporate COLOR TALK TO ME in BASIC programs

-Two application programs:

1. VOICE CALC- Use your voice to enter arithmetic problems and VOICE CALC will display the solution.

2. SCREEN PAINTER- Say a color and the screen will be painted that color.

ALL OF THIS ON TWO CASSETTES FOR ONLY \$49,95!!!

ColorSoft Software Co. will soon be releasing voice recognition programs which can be used once you buy COLOR TALK TO ME. Coming soon: Connect More, Crosswords & more!

ATTENTION PROGRAMMERS: ColorSoft Software Co. will market original voice recognition programs using COLOR TALK TO ME with excellent royalties in return.

Dealer Inquiries Invited

Send check or money order to: ColorSoft Software Co. Add \$2.00 shipping 11764 Raintree Ct. Utica, MI 48087

Spectran Offers New Dimension to Spectaculator

Sometimes it's hard to cope with the frustration of incompatible software. Having two useful programs which can't talk to each other is like being in a foreign country. You really need a translator to get things going. Spectran solves the problem of data incompatibility when loading Spectaculator files into a word processing program. Most word processors, including Radio Shack's Scripsit, expect ASCII text files. Spectaculator produces its own unique files.

Spectran translates Spectaculator files into standard ASCII files or vice versa. Thus, you can easily incorporate spreadsheet data into a report prepared with a word processor, or you can add data from a text file to a new spreadsheet model. This flexibility makes a wide range of applications available to the Spectaculator user.

Running Spectran is easy. You select menu options (1) Spectaculator to ASCII or (2) ASCII to Spectaculator file

ज्ञासाम

SOFTWARE SHOP

(617) 339-3734

We Specialize In Color Computer Programs
Call or Write For Our Catalog

ARCADE STYLE	UTILITIES	EDUCATIONAL
Pac Attac Galax Attax Storm	Tape to Disk Disassembler Assemblers	Spelling Math Geography
ADVENTURE	PERSONAL	BUSINESS
Madness &	Budget	Word Processing
Minatour Keys of the Wizard	Household Expense	Inventory
El Diablaro	Stock Analysis	Gen. Ledgers
Over 100 Dia	fferent Progra	ıms in Stock!

THE SOFTWARE SHOP

) വദ്ധ ഡ ക്യഡ്ര ഉത്രവദ് 200 Chauncy Street Mansfield, MA 02048

Visa and M.C. Accepted

conversions. For option (1) you set a line length for the converted file (32 to 132 columns wide) and then give the name/SPC of the *Spectaculator* file to be converted. The program directs you to change to your word processing disk and to name the new ASCII file. The newly converted file is then written and you are ready to edit or incorporate the data into a report.

Option (2) reverses the above process and allows you to convert an ASCII file to one which can be read by *Spectaculator*. The new *Spectaculator* file has columns set to width ten. Only data values or text are transferred. You cannot transfer equations as column or row relationships.

The whole process is straightforward. The instructions thoroughly cover all the operating points. There are only three basic limitations, which are discussed in the instructions. First, the program only runs from files stored on Drive 0 (obviously not a problem for most of us single drive users). Second, the maximum width of a ASCII data column is 10. Files will still require some reformatting when entered into *Spectaculator*. Third, memory space is limited to 8K for users with a 16K disk system. Larger files will lose data during the file transfer.

My experience with the program emphasized the data formatting limitations. In going from *Spectaculator* to ASCII files, everything worked out well. But reversing the process caused some minor irritations. Blank spaces used to justify columns of data in ASCII tables caused most of the problems. These blanks were converted to a single blank. In addition, some text headings were hopelessly scrambled due to the 10 character per column limit. My suggestion, also in the instructions supplied with the program, is to only transfer data tables, without text, to *Spectaculator*. You can add the text headings after reading the data into *Spectaculator* itself.

Another problem that can cause difficulty is getting file types confused in the conversion process. When I specified a non-Spectaculator file to be converted to ASCII, the system crashed! Only a full, power-down reset could restore operation. I also tried converting a non-ASCII file to Spectaculator. While the system didn't crash as before, I did get some nonsense results in the subsequent Spectaculator program run. These problems did not, however, result in any data being lost or in any subtle errors being propagated.

As a bonus feature, Crimson Software offers two utility programs in the *Spectran* package. Their first bonus is *Disklook*, a disk file utility which reads files and directory information, byte by byte. This program also allows you to modify existing disk files and create new directory entires. A nice discussion of the storage format for the CoCo disk is also provided. The second bonus program is *Dirdupl*, which will save a backup copy of the disk directory on unused sectors of track 17. If you ever need to restore a *KILL*ed file or recover a bad directory, the program will use this backup copy to rewrite the original directory.

I recommend *Spectran* to anyone who needs to transfer ASCII data to *Spectaculator*, or who wants to move *Spectaculator* data files into a word processing system. Used with care, this program solves the file incompatibility problems inherent in Radio Shack's Color Computer software.

(Crimson Software, 32 Beverly Heights, Tuscaloosa, AL 35404, 16K or 32K Color Computer Disk, \$25)

-Stuart Hawkinson



able for use with your home computer system.

Zaxxon™ technology and creativity present a 3-dimensional-like playfield which sets Zaxxon™ apart from other computer games.

Zaxxon™ looks and sounds like aircraft flight, and players can soar to new levels of score points and extra fuel. The enemy fights back with a barrage of missiles and gunfire. Then you face a fleet of enemy fighters in a gripping dogfight of altitude strategy and flying skill. Survive this battle and the enemy's fortress, defended with laser barriers, then you've earned the ultimate challenge; a blazing confrontation with the pow-

9421 Winnetka Avenue Chatsworth, CA 91311 (213) 701-5161 ©1982 Datasoft® Inc.

Datasoft® is a registered trademark of Datasoft Inc.®

Sega® and Zaxxon™ are registered trademarks of Sega Enterprises Inc.

H

Elements

L

e

By Gary Benoit

N a

K

Rb

Cs

lements, requiring 32K and Extended Color BASIC, will be of value to all those with an interest in the sciences, more specifically to chemistry teachers and students.

It displays the complete periodic table of the elements and the eight classes of elements on the graphics screen, in both upper- and lowercase letters. Uppercase letters were designed by M.H. Endres (the Rainbow, May 1982). I found his letters clear and eye pleasing and decided to use them in my program. Only one minor correction had to be made: his letter C DRAW parameters should end with BD4, not BD. Lowercase letters were designed by me.

The program also provides valuable information on each of the 105 known and accepted elements. This information can be displayed on the text screen by simply entering the element's symbol (entering symbols can be done whether you are in the graphics mode or in the text mode, ie, you can request information at any time after initialization). If you are in the text mode, simply pressing the Spacebar will return you to the last graphics screen displayed. Pressing the Spacebar again will advance you to the next graphics screen (pressing the Spacebar continuously will cycle the display through all nine graphics screens). Entering a nonexistent symbol will result in a timed "Entry Error" display and a return to the last displayed graphics screen. As the program requires a two symbol entry for the elements, you must repeat the symbol a second time for all single symbol elements. The total program design, including the liberal use of the INKEY\$ function, has resulted in a very user friendly program. The extensive graphics and large amounts of data have a price: the program is very long (it uses most of the available memory in a 32K CoCo), and will require time and patience, not to mention accuracy, in order to enter the complete listing. For this reason, it is strongly recommended that the program be entered in two or more steps. Needless to say, don't forget to

(Gary E. Benoit, a supervisor for the telephone company in Calgary, Alberta, Canada, has been working with computers for 12 years. His three teenagers and four-year-old are all very interested in computers.)



			В	С	N	D	F		
			well w	CSAVE after each intermediate step. The results are well worth the effort. Should you prefer to bypass all the physical (and mental!) labor, a copy of the program					
Ni	Сu	Z n	check addres	on cassette may be obtained from the author. Send a check or money order for \$8 (U.S.) and write your address clearly. Table of Variables A\$: INKEY\$ function L\$(65—90): DRAW parameters for uppercase letters L\$(97—122): DRAW parameters for lowercase letters (note: subscripts represent ASCII values) NS\$(1—105): element names and symbols AW\$(1—105): atomic weights SG\$(1—105)specific gravities (note: Using string variables, as opposed to numeric variables (e.g. SG\$), for numeric values allows us to represent very large or very small numbers in their original format. Otherwise, the					
Pd	Ag	Cd	L\$(65- L\$(97- (n NS\$(1-						
P	A u	I o	SG\$(1- (n nı al nı						
			TRS-80C would print them in scientific notation) ES\$(1-105): number of electrons in each shell IC\$(1-105): ion charges EN\$(1-105): electronegativity values OO\$(1-105): oxydation numbers AM\$: DRAW parameters for 'Alkali' MT\$: DRAW parameters for 'Metals' AE\$: DRAW parameters for 'Alkaline Earth'						
σ⊣	K O	Но	TM\$: 1 OM\$: 1 NM\$: 1 LA\$: 1	TM\$: DRAW parameters for 'Transition' OM\$: DRAW parameters for 'Other' NM\$: DRAW parameters for 'Non' NG\$: DRAW parameters for 'Noble Gases' LA\$: DRAW parameters for 'Lanthanides' AC\$: DRAW parameters for 'Actinides'					
B k	C	E s	T\$: DA TT\$: D TV\$: D TR\$: D D\$,1\$,1	RAW parame ORAW paran ORAW paran ORAW paran	neters for 'Acters for 'Periodeters for 'Taleneters for 'Gameters for 'Electers for 'Acceptance for 'Acceptanc	odic' ble' the' ements'	various		

spacers

NBOWfes

FREE RAINBOW POSTER For First 200 Tickets Sold. fest is coming your way . . . and now there will be a RAINBOWfest near you!

For the 1983-84 season, we've scheduled four RAINBOWfests in four parts of the ment, new products, seminars and information for your CoCo! And for those who much as you, we've scheduled each RAIN-

Just look at this great lineup:

Fort Worth, Texas — October 14-16. We'll kick off the RAINBOWfest "season" with a visit to CoCo's home — Radio Shack's headquarters in Fort Worth. Our CoCo Community Breakfast will feature Ed Juge, Radio Shack's director of computer merchandising, as the guest speaker. And, we hope to be able to offer tours of Tandy Center for those who will be at what

Long Beach, California — February 17-19. What a way to get away from the winter ny Southern California with thousands of fellow CoCo owners! Fly with CoCo to the sun for the winter. Top flight seminars will draw on many local CoCo experts.

Cherry Hill, New Jersey — April 6—8.
Just 6.3 miles from the Liberty Bell, RAIN-BOWfest comes to the populous northeast. It's a close drive from New York, Boston, Philadelphia, Washington and Balti-

Chicago - June 22-24. We'll play RAIN-BOWfest again, CoCo! This is the site of right next to the world's largest indoor

Regency Hotel and all will be offering special rates for RAINBOWfest. Every show a.m.—4 p.m. session Sunday. Each will have a CoCo Community Breakfast featuring an outstanding national speaker from bition will be interspaced with a number of seminar sessions on all aspects of CoCo

duce. Others with show specials.

Rainbow. We'll also send you a special res-

Come to RAINBOWfest . . . help us all celebrate CoCo Community at its finest!

□- Cherry Hill

RAINBOWfest—Fort Worth DATES: Oct. 14—16, 1983 Hyatt Regency, Ft.Worth \$55 per night single/double

> Director Computer Merchandising Radio Shack

Advance Ticket Deadline: Oct. 10, 1983

RAINBOWfest—Long Beach

Feb. 17-19, 1984 HOTEL Hyatt Regency, Long Beach ROOMS: \$59 per night single/double KEYNOTE: To Be Announced

Advance Ticket Deadline: Feb. 13, 1984

RAINBOWfest—Cherry Hill, NJ

Regency-Hyatt Cherry Hill To Be Announced KEYNOTE: To Be Announced

RAINBOWfest-Chicago

June 22—24, 1984 To Be Announced KEYNOTE: To Be Announced

Advance Ticket Deadline: Mar. 30, 1984

□-Ft. Worth □-Long Beach

Advance Ticket Deadline: June 18, 1984

□-Chicago.



Make checks payable to: the Rainbow

MAIL TO:

RAINBOWfest P.O. BOX 209 Prospect, KY 40059 YES, I'm coming to RAINBOWfest in

Please send me:	
three day tickets at \$8 each	
one day tickets at \$6 each	
breakfast tickets at \$11 each	total
MANAGEMENT OF THE PROPERTY OF THE PARTY OF T	iling Charge \$1.00
TOTAL ENCLOSED (U.S. FUNDS ONLY, P	LEASE) \$
-Also send me a hotel reservation card for	
□-Ft. Worth □-Long Beach □-Phila	adelphia D-Chicago
NAME (please print)	
STREET & NUMBER	
CITY & STATE	
TELEPHONE	ZIP CODE
COMPANY	
Orders sent less than two weeks prior to sh	ow opening will be held for you at the door.
VISA, MasterCharge, American Express acc	cepted.
My Account #	Ex. Date:
Signature	

	5.4	
75	01F4	4252947
150	0540	4902DEA
220	0A48	5753146
260	105F	665 33FD
305	1589	755 36CD
	1AE3	835 3A2E
	1F3D	880 3E26
	2473	END 4141

The listing:

10 REM elements

15 REM GARY BENDIT

20 REM 343 TEMPLEBY PL.N.E.

25 REM CALGARY, AB

30 REM CANADA T1Y 5H2

35 REM JAN.83

40 CLS:PRINT@225,"DO YOU WANT IN STRUCTIONS?(Y/N)"

45 A\$=INKEY\$:IFA\$=""THEN45ELSEIF A\$="Y"THEN85ØELSEIFA\$<>"N"THEN4Ø 5Ø CLSØ:PRINT@23Ø,"ONE MOMENT, P LEASE";

55 CLEAR1800: DIML\$(122), NS\$(105), AW\$(105), SG\$(105), ES\$(105), IC\$(105), EN\$(105), OO\$(105)

60 FORV=65TO90:READL\$(V):NEXT:FO RV=97TO122:READL\$(V):NEXT:GOSUB4 45

65 FORX=1T0105:READNS\$(X),AW\$(X),SG\$(X):NEXTX:FORX=1T0105:READES \$(X):NEXTX:FORX=1T0105:READIC\$(X),EN\$(X),00\$(X):NEXTX

70 REM SET UP SCREEN

75 PMODE4,1:GOSUBBØ:GOTO1ØØ

80 PCLS:CLS0:SCREEN0,0:FORX=14TO 238STEP14:LINE(X,0)-(X,191),PSET :NEXT

85 FORX=42T0154STEP14:LINE(X,Ø)-(X,61),PRESET:NEXT:FORX=168T0224 STEP14:LINE(X,Ø)-(X,21),PRESET:N EXT:FORX=84T0238STEP14:LINE(X,12 2)-(X,141),PRESET:NEXT:FORX=14T0 238STEP14:LINE(X,142)-(X,150),PR ESET:NEXT

90 LINE(14,150)-(14,191), PRESET: LINE(238,150)-(238,191), PRESET: LINE(28,0)-(28,21), PRESET

95 FORY=21T0141STEP20:LINE(0,Y)-(255,Y),PSET:NEXT:LINE(0,150)-(2 55,150),PSET:LINE(0,171)-(255,17 1),PSET:SCREEN1,0:RETURN

100 GOSUB195:GOSUB200:GOSUB205:G OSUB210:GOSUB215:GOSUB225:GOSUB2 35:GOSUB255:GOSUB265:Z=1

105 A\$=INKEY\$:IFA\$=""THEN105ELSE IFA\$=" "THEN110ELSE520

110 GOSUB80:GOSUB205:DRAW"BM72,1 0;XAM\$;XI\$;XMT\$;":PSET(109,4):Z= 2

115 A\$=INKEY\$:IFA\$=""THEN115ELSE IFA\$=" "THEN120ELSE520

120 GOSUB80:GOSUB210:DRAW"BM46,1 0;XAE\$;XI\$;XMT\$;":PSET(83,4):Z=3 125 A\$=INKEY\$:IFA\$=""THEN125ELSE IFA\$=" "THEN13ØELSE52Ø
13Ø GOSUB8Ø:GOSUB235:DRAW"BM62,1
Ø;XTM\$;XI\$;XMT\$;":PSET(99,4):PSE
T(113,4):Z=4
135 A\$=INKEY\$:IFA\$=""THEN135ELSE
IFA\$=" "THEN14ØELSE52Ø
14Ø GOSUB8Ø:GOSUB225:DRAW"BM78,1
Ø;XOM\$;XI\$;XMT\$;":Z=5
145 A\$=INKEY\$:IFA\$=""THEN145ELSE
IFA\$=" "THEN15ØELSE52Ø
15Ø GOSUB8Ø:GOSUB215:DRAW"BM92,1
Ø;XNM\$;XMT\$;":Z=6

155 A\$=INKEY\$: IFA\$=""THEN155ELSE IFA\$=" "THEN16ØELSE52Ø

160 GOSUB80: GOSUB200: DRAW"BM80, 1 0; XNG\$; ": Z=7

165 A\$=INKEY\$:IFA\$=""THEN165ELSE IFA\$=" "THEN17ØELSE52Ø

170 GOSUB80: GOSUB255: DRAW"BM86, 1 0; XLA\$; ": PSET (137, 4): Z=8

175 A\$=INKEY\$:IFA\$=""THEN175ELSE IFA\$=" "THEN18ØELSE52Ø

180 GOSUB80:GOSUB265:DRAW"BM94,1 0;XAC\$;":PSET(117,4):PSET(131,4) :Z=9

185 A\$=INKEY\$:IFA\$=""THEN185ELSE IFA\$=" "THEN75ELSE520

190 REM DRAW CLASSES OF ELEMENTS 195 DRAW"BM22,10;XT\$;BM82,10;XTT \$;BM123,10;XTV\$;BM171,10;XTR\$;": PSET(44,4):PSET(65,4):DRAW"BM5,9 ;XL\$(72);":RETURN

200 DRAW"BM244,9;XL\$(72);XD\$;XL\$(101);BD13BL4;XL\$(78);XD\$;XL\$(101);BD12BL4;XL\$(65);XD\$;XL\$(114);BD12BL4;XL\$(75);XD\$;XL\$(114);BD12BL4;XL\$(88);XD\$;XL\$(101);BD12BL4;XL\$(82);XD\$;XL\$(110);":RETURN 205 DRAW"BM5,30;XL\$(76);XD\$;XL\$(97);BD12BL4;XL\$(75);BD12BL4;XL\$(97);BD12BL4;XL\$(75);BD20BL4;XL\$(82);XD\$;XL\$(115);BD12BL4;XL\$(70);XD\$;XL\$(114);":PSET(7,32):RETURN

210 DRAW"BM19, 30; XL\$ (66); XD\$; XL\$ (101); BD12BL4; XL\$ (77); XD\$; XL\$ (103); BD12BL4; XL\$ (67); XD\$; XL\$ (97); BD12BL4; XL\$ (83); XD\$; XL\$ (114); BD12BL4; XL\$ (66); XD\$; XL\$ (97); BD12BL4; XL\$ (82); XD\$; XL\$ (97); "RETURN 215 DRAW"BM173.30; XL\$ (66); RR10; X

215 DRAW"BM173,30; XL\$(66); BR10; X L\$(67); BR10; XL\$(78); BR10; XL\$(79); BR10; XL\$(70); BL46BD20; XL\$(83); X D\$; XL\$(105); XK\$; XL\$(80); BR10; XL\$(83); BR10; XL\$(87); XD\$; XL\$(108); ":PSET(189,52)

220 DRAW"BM201,70; XL\$(65); XD\$; XL\$(115); XK\$; XL\$(83); XD\$; XL\$(101); XK\$; XL\$(66); XD\$; XL\$(114); BL18BD12; XL\$(84); XD\$; XL\$(101); XK\$; XL\$(7

3);BD2ØBL4;XL\$(65);XD\$;XL\$(116);
":RETURN

225 DRAW"BM173,50;XL\$(65);XD\$;XL\$(108);BD12BL18;XL\$(90);XD\$;XL\$(110);XK\$;XL\$(71);XD\$;XL\$(97);XK\$;XL\$(71);XD\$;XL\$(97);XK\$;XL\$(71);XD\$;XL\$(101);BL32BD12;XL\$(67);XD\$;XL\$(100);XK\$;XL\$(73);XD\$;XL\$(110);XK\$;XL\$(83);XD\$;XL\$(110);"

23Ø DRAW"BM2Ø1, 9Ø; XL\$(83); XD\$; XL\$(98); BL46BD12; XL\$(72); XD\$; XL\$(1 Ø3); XK\$; XL\$(84); XD\$; XL\$(1 Ø8); XK\$; XL\$(80); XD\$; XL\$(80); XD\$; XL\$(80); XD\$; XL\$(80); XD\$; XL\$(111); ":PSET(203,112): RETURN 235 DRAW"BM33, 70; XL\$(83); XD\$; XL\$(99); XK\$; XL\$(84); XD\$; XL\$(105); XK\$; XL\$(86); BR10; XL\$(67); XD\$; XL\$(1 14); XK\$; XL\$(77); XD\$; XL\$(1 14); XK\$; XL\$(1 14); XK\$; XL\$(1 15); XD\$; XL\$(1 16); XK\$; XL\$(1 17); ":PSET(49,72):PSET(133,72)

24Ø DRAW"BM131,7Ø;XL\$(78);XD\$;XL\$(105);XK\$;XL\$(67);XD\$;XL\$(117);BL116BD12;XL\$(89);BR1Ø;XL\$(9Ø);XD\$;XL\$(9Ø);XD\$;XL\$(114);XK\$;XL\$(78);XD\$;XL\$(98);XK\$;XL\$(97);XD\$;XL\$(111);XK\$;XL\$(84);XD\$;XL\$(99);"

245 DRAW"BM103,90;XL\$(82);XD\$;XL

ELCIRCAN

ACTIVE and/or PASSIVE LINEAR ELECTRONIC CIRCUIT ANALYZER

16K EXTENDED BASIC CASSETTE FEATURES:
:circuit editor; tape save and load
:compute gain and phase versus frequency
:output to screen, printer, or cassette
:file listing utility to screen or printer

ADDED 32K DISK BASIC FEATURES:

:program and data chaining via disk
:auch larger circuit files possible
:compute circuit delay versus frequency
:printer utility to graphically plot
circuit response to any ASCII printer

CASSETTE--\$24.95 DISK--\$34.95 add \$2 for shipping or \$4 for C.O.D 24 hour C.O.D order tape (619) 470-3801

DIGITAL-LINEAR SYSTEMS ENG. P.O. Box 754 NATIONAL CITY, CALIF. 92050

custom engineering services

25Ø DRAW"BM75,11Ø; XL\$(87); BR1Ø; X L\$(82); XD\$; XL\$(1Ø1); XK\$; XL\$(79); XD\$; XL\$(115); XK\$; XL\$(73); XD\$; XL\$ (114); XK\$; XL\$(8Ø); XD\$; XL\$(116); X K\$; XL\$(65); XD\$; XL\$(117); BL116BD1 2; XL\$(65); XD\$; XL\$(99); XK\$; XL\$(82); XD\$; XL\$(102); XK\$; XL\$(72); XD\$; X L\$(97); ": RETURN

255 DRAW"BM33,159;XL\$(67);XD\$;XL\$(101);XK\$;XL\$(80);XD\$;XL\$(114);
XK\$;XL\$(78);XD\$;XL\$(100);XK\$;XL\$(80);XD\$;XL\$(109);BR9BU8;XL\$(83);XD\$;XL\$(109);BR9BU8;XL\$(69);XD\$;XL\$(100);XK\$;XL\$(117);XK\$;XL\$(71);XD\$;XL\$(100);XK\$;XL\$(98);"

26Ø DRAW"BM145,159; XL\$ (68); XD\$; X L\$ (121); XK\$; XL\$ (72); XD\$; XL\$ (111); XK\$; XL\$ (69); XD\$; XL\$ (114); XK\$; XL \$ (84); XD\$; XL\$ (1Ø9); BR9BUB; XL\$ (89); XD\$; XL\$ (76); XD\$; XL \$ (117); ": RETURN

265 DRAW"BM33,180; XL\$(84); XD\$; XL\$(104); XK\$; XL\$(80); XD\$; XL\$(97); XK\$; XL\$(85); BR10; XL\$(78); XD\$; XL\$(117); XK\$; XL\$(85); XD\$; XL\$(117); XK\$; XL\$(65); XD\$; XL\$(109); BR9BU8; XL\$(67); XD\$; XL\$(66); XD\$; XL\$(107); BR9BU8; XL\$(66); XD\$; XL\$(107); "

27Ø DRAW"BM145,18Ø; XL\$(67); XD\$; X L\$(102); XK\$; XL\$(69); XD\$; XL\$(115); XK\$; XL\$(70); XD\$; XL\$(109); BR9BU8; XL\$(77); XD\$; XL\$(100); XK\$; XL\$(78); XD\$; XL\$(111); XK\$; XL\$(76); XD\$; X L\$(114); ": RETURN

275 REM DRAW LETTERS

28Ø DATA"U4E2F2D2L4R4D2", "RU6LR3 FDGL2R2FDGL3BR4", "BR4BUGL2HU4ER2 FDBD4"

285 DATA"RU6LR3FD4GL2BR3", "U3R4L4U3R4BD6", "B 4U3R4BD6L4R4", "U3R4L4U3R4BD6", "B R2BU3R2D2GL2HU4ER2FBD5", "U6D3R4U 3D6", "BRR2LU6LR2BRBD6", "BU2DFR2E U5BD6", "U6BR4G3F3", "R4L4U6BR4BD6 ", "U6F2E2D6", "U6DF4U5D6", "R4L4U6 R4D6"

29Ø DATA"UGR3FDGL3BR4BD3", "BUU4E R2FD4GL2HBR2BUF2", "UGR3FDGL3RF3" ,"BUFR2EUHL2HUER2FBD5", "BUGR4L2D GBR2", "UGDGR4UGD6", "BUGD4F2E2U4B D6", "UGDGE2F2UGD6", "UE2H2UDF2E2U DG2F2D", "BUGDF2E2UDG2D3BR2", "BUG R4DG2LR2LG2DR4"

295 DATA"BU4R3FD2GL2HUR4BD2", "U5 D2R3FDGL3BR4", "BUU2ER3BG3BLFR3",

Super Sale on New Disk Drives

Starting at \$199.95 complete!! with Power Supply and Case.

Tandon — Siemens — Remex — MPI — Teac — Shugart

single sided 40 track — dual sided 40 track single sided 80 track — dual sided 80 track

RADIO SHACK'— HEATH/ZENITH²— APPLE³/FRANKLIN⁴ IBM/PC-TEXAS INSTRUMENTS'& MOST OTHER COMPUTERS Drive a Hard Bargain!!™

8 M.B. - 12M.B. with Power Supply Case, Cables & Software Complete Systems from \$1,295.00

Amazing Special!-dual sided 40TK or 80TK drive with Power Supply and Case and Our Special Warranty - Starting at \$Call

TOLL FREE ORDERING GENERAL AND TECHNICAL

1-800-343-8841

1-617-872-9090

Model /
Color Computer Drives (0 1 2 3)starting at \$ Call
Apple/Franklin Compatible Add-On Drives
Apple/Franklin Compatible Drives with Controller
Model I/III/IV Memory Upgradestarting at \$Call
Printers — Daisywheel/Dot Matrix\$Call
Diskettes Quantity Priced from \$17.00
Cases and Power Supplies — (Single-Dual-1/2 Height)starting at \$49.95
Printer Butters 8K to 512K starting at \$143 Q5
Percom Double Density Controller (Model I)
Holmes Model I/III Speed-up Mod-VID/80starting at \$90.00
Gold Fingered Edge Card Extendersstarting at \$13.00
Cables — Printer/Disk Drivestarting at \$25.00
DOSPLUS\$Special prices
Repair Services Now Offered for Disk Drives—Fast Turn-a-Round\$Call

One Year Warranty Available on all Drives!

One Edgell Road, Framingham, MA 01701 (617) 872-9090 Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.) Sat. 10 am to 5 pm

DRIVES DISK M.C./Visa/Amex and personal checks accepted at no extra charge. C.O.D., please add \$3.00. Shipping: Please call for amount.

Canada MICRO R.G.S. INC. 751. CARRE VICTORIA, SUITE 405 MONTREAL, QUEBEC, CANADA, H2Y 2J3 Regular Tel. (514) 845-1534 Canadian Toll Free 800-361-5155

Dealer inquiries invited.

- TANDY CORPORATION
- ZENITH DATA SYSTEMS APPLE COMPUTER CORP.
 - FRANKLIN COMPUTER, INC.
- IBM CORPORATION "TEXAS INSTRUMENTS
- © Copyright 1983

DISK DBINES DISK DBINES

DISK DRIVES DISK

"BRHUER3U2D5L3BR3", "BRHU2ER2FDL2 BF2L3R3", "BR2U5EBD3L2BR3BD3", "R3 EU3HL2GDFR2EBD3", "U6BD3R3FD2", "B RRU4LRD4RBR", "BUFREU3LR2BD4", "BR U5BR3G3RF2", "BRRU5LRD5RBR", "BLU4 R3D4U4R3D4"

300 DATA"U4R3FD3", "BRR2EU2HL2GD2 FBR3", "U5R3FDGL3BD2BR4", "BR4U5L3 GDFR3BD2", "U4DER3BD4", "R3EUL4UER 3BD4", "BU4R3L2U2D5FRBR", "BU4D3FR 2EU3D4", "BU2U2BR4D2G2H2BR4BD2", " U4BD4E2F2U4BD4", "E4BL4F4", "E4BL4 F2BF2", "BU4R4G4R4"

3Ø5 REM ELEMENT INFO

31Ø DATA HYDROGEN h,1.00797,0.00 009, HELIUM he,4.0026,0.00018,LIT HIUM li,6.939,0.534, BERYLLIUM be ,9.01222,1.85, BORON b,10.811,2.4 5, CARBON c,12.0111,3.52, NITROGEN n,14.0067,0.00125, OXYGEN 0,15.9 994,0.001429, FLUORINE f,18.9984, 0.0017

315 DATA NEON ne,20.183,0.0009,S ODIUM na,22.9898,0.97,MAGNESIUM mg,24.312,1.74,ALUMINUM al,26.98 15,2.70,SILICON si,28.086,2.4,PH OSPHORUS p,30.9738,1.83,SULFUR s,32.064,2.0,CHLORINE cl,35.453,0.0032,ARGON ar,39.948,.00178



320 DATA POTASSIUM k,39.102,0.86, CALCIUM ca,40.08,1.55, SCANDIUM sc,44.956,2.5, TITANIUM ti,47.90,4.5, VANADIUM v,50.942,5.96, CHROMIUM cr,51.996,7.1, MANGANESE mn,54.938,7.2, IRON fe,55.847,7.87,COBALT co,58.9332,8.9, NICKEL ni,58.71,8.9

325 DATA COPPER cu,63.54,8.92,ZI NC zn,65.37,7.14,GALLIUM ga,69.7 2,5.9,GERMANIUM ge,72.59,5.36,AR SENIC as,74.9216,5.7,SELENIUM se,78.96,4.8,BROMINE br,79.909,3.1 2,KRYPTON kr,83.80,0.0037,RUBIDI UM rb,85.47,1.53,STRONTIUM sr,87.62,2.6

330 DATA YTTRIUM y,88.905,3.8,ZI RCONIUM zr,91.22,6.4,NIOBIUM nb, 92.906,8.4,MOLYBDENUM mo,95.94,1 0.2,TECHNETIUM tc,(97),,RUTHENIU M ru,101.07,12.2,RHODIUM rh,102.905,12.5,PALLADIUM pd,106.4,12.1 6,SILVER ag,107.87,10.5,CADMIUM cd,112.40,8.65

335 DATA ÍNDIUM in,114.82,7.3,TI N sn,118.69,7.3,ANTIMONY sb,121. 75,6.684,TELLURIUM te,127.60,6.2 4,IODINE i,126.9044,4.93,XENON x e,131.30,0.0058,CESIUM cs,132.90 5,1.9,BARIUM ba,137.34,3.5,LANTH ANUM la,138.91,6.15,CERIUM ce,14 0.12,6.9

34Ø DATA PRASEODYMIUM pr,14Ø.9Ø7,6.5,NEODYMIUM nd,144.24,6.9,PRO METHIUM pm,(145),,SAMARIUM sm,15 Ø.35,7.7,EUROPIUM eu,151.96,,GAD OLINIUM gd,157.25,,TERBIUM tb,15 8.924,,DYSPROSIUM dy,162.5Ø,,HOL MIUM ho,164.93Ø,,ERBIUM er,167.2 6,4.77

345 DATA THULIUM tm, 168.934,, YTT ERBIUM yb, 173.04, 5.51, LUTETIUM 1 u, 174.97, HAFNIUM hf, 178.49,, TAN TALUM ta, 180.948, 16.6, TUNGSTEN w, 183.85, 19.3, RHENIUM re, 186.2, 20.53, OSMIUM os, 190.2, 22.57, IRIDIU M ir, 192.2, 22.4, PLATINUM pt, 195.09, 21.37

350 DATA GOLD au,196.967,19.3,ME RCURY hg,200.59,13.55,THALLIUM t 1,204.37,11.85,LEAD pb,207.19,11.34,BISMUTH bi,208.98,9.8,POLONI UM po,(210),,ASTATINE at,(210),,RADON rn,(222),0.00973,FRANCIUM fr,(223),,RADIUM ra,(226),5.0355 DATA ACTINIUM ac,(227),THOR IUM th,232.038,11.2,PROTACTINIUM pa,(231),,URANIUM u,238.03,18.7,NEPTUNIUM np,(237),PLUTONIUM pu,(244),,AMERICIUM am,(243),,CUR

Upgrade Your Color Computer With A Key Tronic Keyboard.

Simple to install in your TRS-80 Color Computer*. A high-quality Replacement Keyboard from Key Tronic . . . the world's leading keyboard manufacturer for computer terminals.

FEATURES

- 15-20% higher data input rate compared to standard color computer keyboard.
- User programmable function key.
- Familiar typewriter layout.
- Complete legend description.
- High reliability-keys do not stick or jam.

Additional features include — high spring force on "clear" and "break" keys to prevent entry errors, full sculptured keytop array with low profile keytops, and locating "pips" on home row keys.

ORDERING INFO:

Price: \$89.95, please add \$4.95 for plug adapter, part #500c, for models produced after Oct., '82 (Rev F and later).

To order Model KB-500 Call Toll Free: 1-800-262-6006 (8 am - 4 pm Pacific Standard Time). Warranty information may be obtained, free of charge, by writing to the address below.





Radio Shack

TRS-80

COLOR



*Radio Shack is a registered trademark of Tandy Corp.

key tronic

THE RESPONSIVE KEYBOARD COMPANY

Dept. E2 • P.O. Box 14687 • Spokane, Washington 99214 USA

AUTHORIZED DISTRIBUTORS

BASIC TIME Los Angeles. CA (213) 538-9711 (800) 323-8437

C-J SALES, INC. San Francisco, CA (415) 941-6892 J C SALES Los Angeles, CA (213) 340-6136 PERIPHERAL SUPPORT, INC. Chicago, IL (312) 593-5900 OED ELECTRONICS, INC. Philadelphia, PA (215) 657-5600 RHINO SALES COMPANY Brighton, MI (313) 227-1788 DIGITAL ENTRY SYSTEMS, INC Boston, MA (617) 899-6111 COMPUTER-MATE, INC.
Dallas, TX (800) 442-4006 (Texas)
(800) 527-3643 (Continental U.S.)
COMPONENTS UNLIMITED, INC.
Lynchburg, VA (804) 384-6000
FORESIGHT COMPUTER PRODUCTS, INC
Seattle, WA (206) 747-4005

Lynchburg, VA (804) 384-6000 Calgary, Alb FORESIGHT COMPUTER PRODUCTS, INC Seattle, WA (206) 747-4005 SSE PRODUCTS, INC Elmont, NY (516) 872-9001

FUTURE ELECTRONICS, INC. Montreal, Quebec (514) 694-7710 Ottawa, Ontario (613) 820-8313 Toronto, Ontario (416) 663-5563 Calgary, Alberta (403) 259-6408 Edmonton, Alberta (403) 486-0974 Vancouver, B. C. (604) 438-5545

THE TOP-RATED COCO WORD PROCESSOR:

processors available for the Color Computer. We came to the very same conclusion that so many review articles have! Telewriter-64 is, by far, the superior word processor for the Color Computer

Why is Telewriter so much better than the others? For one thing, it has overcome the 32x16 character display limitation of the Color Computer. No small feat, Telewriter accomplishes this by generating its own set of characters in software. You select 51x24, 64x24 or 85x24 character displays by merely issuing a format command. If you have ever used a word processing system, you know how important it is to be able to see a good portion of your text on the screen.

ı	ħ	11.5		6	*			100	-	un		to	KK	he	d		lo		id		ho	to		ŧ	2		١
T	bl	at.	k tt	20	d	nt a	it	e ne	×	re te	en	5	h	ųi Te	na le	1	he xt	5	12	24	-	ha ot	ra it	et e	er		
	100	4	ö.	P.1	iê,	о	1	1	r	0	ha	×	w	*	ďν	C.P	-	*	S.A	e t	64	N	ar		44		
									ĸ					ol										mt			
	- 54	a)	١Ì١	t i	24	ıtı	M.	W	m	5.4	ire	20	121	or		rox:	l t	ar	١Ł	KO)	116	CE	-3	ica	e		
ч	04		are	H	hi	ni	(if	19	Of	1	H	п	n		XIII	1	W	W	TH	a	13	13	Ø,	301	4		
	118	SATI	£1	a l	th	-	w	10	K.	S	151		W.	64	æ	50	rs l	e	¥	er HH	1	-	h	1			
п						2	35	33	8			100		*1													
	A	8	C	3	E	F	6	H	I	J	K.	L	Ħ	N	0	P	9	R	\$	1	Ų	V	ш	X	12.		
	- 2	1	5	3	4	5	6	7	8	9	0	1			\$	1	\$		6)			t	8	1		
A	a	b	t	0		F	1	h	ī	1	k	1	H	n	0	P	4	r	s	t	v	٧	M	1	¥		H
						1	u	2	ц,	10	-	-		4			1	10	*				Œ				- 1

Telewriter-64 also generates true lower case characters. This is much preferable to the reverse characters that merely "represent" lower case letters in other co-co word processors.

Telewriter-64 is feature packed. Besides the standard features

TELEWRITER-64

found in any word processor, Telewriter also includes: user-friendly full-screen editing, rapid cursor and scrolling control, page jump. right justification, menu-driven disk or cassette access, compatability with spelling checkers (such as Spell-and-Fix), and a clever double check that asks the user "Are you sure?" before executing any operation that would kill any sizeable amount of your text.

Telewriter-64 runs on any 16K, 32K, or 64K system (extended Basic not required) and works with any printer. It has all of the control codes necessary to take full ad-vantage of all of the features in any

printer. There is even a "typewriter" mode which sends typed lines directly to your printer.

With advanced word processing software such as this, your color computer becomes a truly powerful word processing system, with a price that makes sense for the per-

Beyond impressive capability, Telewriter-64 simply makes any kind of writing a pleasure. It is a truly sophisticated system that is marvelously easy to learn and enjoyable to use.

Disk \$59.95 \$49.95 Cassette.

EXTENSION CABLE FOR YOUR MODEM/PRINTER

want. 15 ft. cable with four-pin male and four-pin female DIN connectors.

COCO ROM/PROJECT/PRODUCT CASE



QUANTITY	PRICE EACH
2-4 (2 min.)	\$5.50
5-9	3.50
10-99	2.75
100 & up	CALL

Give a Professional look to your project or product

- Designed especially for the Color Computer ROM slot.
- High quality 3 piece injection molded black plastic with spring-loaded door.
- Same size and specifications as Radio Shack ROMpak

QUALITY DISK DRIVE CABLES



High quality cable and high force, gold plated contacts ensure the utmost in connection reliability for your CoCo or TDP-100.

- 1) Disk pack extender, 3 ft. . . \$29.95
 Allows you to move your disk drive interface back and out of the way.
- One Drive Disk cable \$19.95
- Two Drive Disk cable \$29.95

SUPER-PRO KEYBOARD

REPLACEMENT PROFESSIONAL KEYBOARD KIT ... ONLY \$69.95

- Contour molded, full travel keys for fast smooth typing.
- Custom made to fit precisely. Has same key layout.
- Complete, easy instructions for any CoCo or TDP-100.
- Ideal for word processing and other serious CoCo use. Note: For computers manufactured after Oct. 1982, add \$4.95

UPGRADE IN JUST MINUTES!



COLORWARE INC. 78-03F Jamaica Ave. (212)647 - 2864

COLORWARE LIGHT PEN



ONLY \$19.95 **FREE PROGRAM** CASSETTE INCLUDED

- Plugs directly into your joystick port.
- Comes with six fun & useful programs on tape.
- Easy instructions show how to use it with Basic.
- Comptible with light pen software such as Computer Island's "Fun-pak."

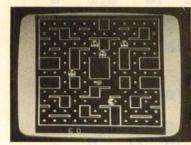


TOLL FREE ORDERING 800-221-0916



Orders only. NY & Info call (212) 647-2864

WE PAY shipping on any order that includes at least one game Use our convenient toll free 800 line.



GHOST GOBBLER

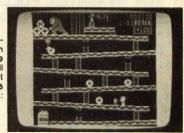
From Spectral Associates, this 'Pac" theme game is the best of it's type. Brilliant color, action and sound, just like an arcade gobble your way to glory, but watch for those ghosts! Get in on the wild fun of this game craze now. Tape: \$21.95, Disk: \$25.95

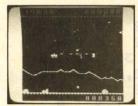
GHOST GOBBLER

DONKEY KING

DONKEY KING

You simply can not buy a more impressive game for your color computer than this new wonder from Tom Mix. The graphics, sound, and animation are all just astonishing! There are four different graphic screens and each is endless fun. Requires 32K. Tape: \$24.95, Disk:





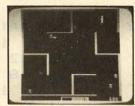
PROTECTORS

There are several good versions of the "Defender" theme available for the CoCo. None, however, rival this one from Tom Mix. No other game matches the detailed graphics and sheer excitement of this top seller. Requires 32K. \$24.95, Disk: \$27.95



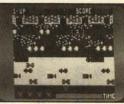
CREATURE FEATURE

From Color Software, comes a lightening swift shoot & dodge the enemy game. It's clever cross between "Robotron" and "Beserk" themes, with bullets flying everywhere. Solid, shootem-up-fun. Requires Tape: \$17.95. Disk: \$19.95 16K



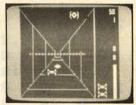
ANDROID ATTACK

Spectral Associates' very well done "Berserk" type game with some interesting added fea-tures. Each cassette contains both the 16K and 32K version. The 32K version has voice output! Plenty of action. Tape: \$21.95



FROGGER

Just released by The Cornsoft Group, this is the officially licensed version from Sega, the arcade manufacturer. It has it all! 4 lane super highway, snakes, turtles, logs, alligators, etc. Lots of action and laughs! Requires 16K. Tape: \$19.95



INTERGALACTIC FORCE

Your space fighter roars into the Death Corridor. Lock-on and blast the enemy fighter from the sky. Now try dropping one into Death Star's narrow exhaust vent. It takes skill and guts. Good luck! With "Star Wars" theme song. From Anteco.

THE COLORCADE..

SUPER JOYSTICK MODULE



* It's a Joystick Interface.

Now you can connect any Atari compatible joystick to your CoCo. These sticks are extremely rugged & provide very fast response and real arcade type action. They will improve the play of almost any game. The difference will amaze you!

★ It's a Rapid Fire Module!

Press the fire button on your joystick and get a great burst of fire instead of just a single shot! Adds tremendously to the many shooting type games that do not have repeat fire. With variable

★ It's a 6ft. Extender Cord.

THEATARI



proven joystick, the Atari is A well known for being rugged and reliable. It gives good response and is the stan-dard among home video players. Now at a great price! Use with module above

ZIRCON VIDEO COMMAND

A GREAT

This one has received outstanding reviews. Its unique design fits the hand beautifully and it has the truly fast and positive response needed for high

speed play. Actually out-performs some joysticks that cost \$50 or more.

WICO FAMOUS "RED BALL"



THE BEST YOU CAN BUY

The high performance joystick from the people who make them for the arcade machines. Built to take the abuse of even the most enthusiastic player. This is the best! Wico #15-9730. Use with module above.

ORDERING INFORMATION

ADD \$2.00 PER ORDER FOR SHIPPING WE ACCEPT VISA, MASTERCARD, CHECKS, M.O. C.O.D. ADD \$3.00 EXTRA NY RESIDENTS ADD SALES TAX. OVERSEAS, FPO, APO, ADD 10% DEALER DISCOUNTS AVAILABLE IF ONE OR MORE GAMES ARE INCLUDED SHIPPING IS FREE.

OLORWARE

COLORWARE INC. 78-03F Jamaica Ave. Woodhaven, NY 11421 (212)647 - 2864



TOLL FREE ORDERING



Orders only, NY & Info call (212) 647-2864

IUM cm, (247), , BERKELIUM bk, (247) ,,CALIFORNIUM cf, (251),,EINSTEIN IUM es, (254), 360 DATA FERMIUM fm, (257), MENDE

LEVIUM md, (258), NOBELIUM no, (25 5),,LAWRENCIUM 1r OR 1w, (256),,R UTHERFORDIUM rf, (261), HAHNIUM h a, (262),

365 REM ***ENTER FOLLOWING DATA EXACTLY AS SHOWN, INCLUDING SPAC ES***

37Ø DATA 1,2,2 1,2 4,2 5,2 6,2 7,2 8,2 1,2 2,2 8 4,2 5,2 8 6,2 8 8,2 8 8 8 1,2 8 9 8 8 10 2,2 8 11 2,2 8 13 1 375 DATA 2 8 2,2 14 8 8 2,2 15 2,2 8 16 2 ,2 8 18 1,2 8 18 2,2 3,2 4,2 18 8 8 18 8 18 5,2 8 18 6,2 8 18 7,2 8 18 8 8 8,2 18 2 8 18 8 2,2 18 9 2,2 38Ø DATA 2 8 18 10 12 1,2 8 18 13 1,2 2,2 15

1,2 8 18 16 1,2 8	18
18,2 8 18 18 1,2 8	18
18 2,2 8 18 18 3,2	8
18 18 4,2 8 18 18 5	
385 DATA 2 8 18 18 6,2 18 18 7,2 8 18 18	0 2
8 18 18 8 1,2 8	10
18 8 2 2 8 18 18 9	2
18 8 2,2 8 18 18 9 ,2 8 18 20 8 2,2 8	18
21 8 2,2 8 18 22	8
2,2 8 18 23 8 2	
39Ø DATA 2 8 18 24 8	2,2
8 18 25 8 2,2 8	18
25 9 2,2 8 18 27 8	2
,2 8 18 28 8 2,2 8	18
29 8 2,2 8 18 30	8
2,2 8 18 31 8 2,2	8
29 8 2,2 8 18 3Ø 2,2 8 18 31 8 2,2 18 32 8 2,2 8 18 32	9
2	
395 DATA 2 8 18 32 10	2,2
8 18 32 11 2,2 8	
32 12 2,2 8 18 32 13	
,2 8 18 32 14 2,2 8	17
32 15 2,2 8 18 32 1,2 8 18 32 18 1,2	1/
18 32 18 2,2 8 18 32	18
3	
400 DATA 2 8 18 32 18	
400 DATA 2 8 18 32 18	4.2

For Your TRS-80 Color Computer

128 Full-time Audio Talk/Tutor Programs!







We're Your Educational **Software Source**

LANGUAGE ARTS

Spelling (16 programs) Level 3-4 (16 programs) (words in context with definitions and synonyms)

Phonics (16 programs) English as a

Second Language (32 programs)

MATHEMATICS Levels 1-6 Numbers (16 programs) Basic Algebra (16 programs)

SCIENCE & TECHNOLOGY

Physics (16 programs)

In Color, with Pictures and Text!

All of our TRS-80 Color programs have easy to understand professional announcer narration, not synthesized, robotic voices. All text is displayed in easy to read upper- and lower-case characters. Video clearly illustrates key concepts in each frame of the program.

Only \$4.40 per program.(\$8.80 for 2, one on each side of a half-hour cassette). \$59.00 for 16 programs (8 cassettes) in an album. Send for a catalog of over 1000 programs for Atari, TRS-80, Apple, etc.

For more information, or to order call:



Educational Systems, Inc. Box 1226, Norman, OK 73070 32 18 6,2 8 18 32 18 ,,2 8,2 8 18 32 18 8 18 8 32 18 8 32 1,2 18 2,2 32 9 18 8 8 18 18 2,2 2 8 18 32 18 10 9 405 DATA 2 8 18 32 20 18 32 21 9 2,2 8 32 22 9 2,2 8 18 8 18 32 32 24 8 2,2 8 18 32 8 2,2 8 18 25 32 26 9 2,2 8 18 2,2 18 32 28 8 2 8 41Ø DATA 2 8 18 32 29 8 32 3Ø 8 2,2 8 18 32 2,2 31 8 18 8 18 32 8 2,2 8 32 32 18 9 2,2 32 8 18 32 10 2,2 8 18 32 32 11 2 415 DATA +,2.1,+1(-1),,,,+,1.0,+ 1,2+,1.5,+2,,2.Ø,+3,,2.5,+4,3-,3 .0,+5(-3),2-,3,5,-2,-,4.0,-1,,,, +, Ø. 9, +1, 2+, 1, 2, +2, 3+, 1.5, +3, ,1. 8, +4, 3-, 2, 1, +5, 2-, 2, 5, +6(-2), -, 3 .Ø,−1,,, 42Ø DATA +, Ø. 8, +1, 2+, 1. Ø, +2, 3+, 1 .3,+3,4+,1.5,+4,5+,1.6,+5(+4),3+ ,1.6,+6(+3),2+,1.5,+7(+2),3+,1.8 ,+3(+2),2+,1.8,+3(+2),2+,1.8,+2, 2+, 1.9, +2, 2+, 1.6, +2, 3+, 1.6, +3, 4+ 1.8, +4.3-, 2.0, +3.2-, 2.4, +6(-2),-,2.8,-1,,,,+,Ø.8,+1,2+,1.Ø,+2,, 1.2,+3,,1.4,+4 425 DATA ,1.6,+5,,1.8,+6,,1.9,+7 ,,2.2,+3,,2.2,+3,2+,2.2,+2,+,1.9 ,+1,2+,1.7,+2,3+,1.7,+3,4+,1.8,+ 4(+2),3+,1.9,+3,2-,2.1,+6(-2),-, $2.5, -1, , , +, \emptyset.7, +1, 2+, \emptyset.9, +2, , 1.$ 1,+3,3+,1.1,+3,3+,1.1,+3,3+,1.2, +3,3+,1.1,+3,3+,1.2,+3 43Ø DATA 3+,1.1,+3,3+,1.1,+3,3+, 1.2,+3,3+,1.1,+3,3+,1.2,+3,3+,1. 2,+3,3+,1.2,+3,3+,1.1,+3,3+,1.2, +3,,1.3,+4,,1.5,+5,,1.7,+6,,1.9, +7,,2.2,,,2.2,,4+,2.2,+4(+2),3+, 2.4,+3,2+,1.9,+2,+,1.8,+3,2+,1.8 ,+2,3+,1.9,+3,2+,2.Ø,,-,2.2,-1,, $,,+,\emptyset.7,+1$ 435 DATA 2+,0.9,+2,3+,1.1,+3,4+, 1.3,,5+,1.5,,6+,1.7,,5+,1.3,,4+, 1.3,,3+,1.3,,3+,1.3,,3+,1.3,,3+, 1.3,,,1.3,,,,,,,,,,,,,,,,,, 440 REM SET UP STRINGS FOR TITLE 445 Rs="BR3":Qs="BR8":Ds="BD8BL4 ":K\$="BR1@BU8":S\$="BR2":I\$="BR16 450 Ts=Ls(80)+Rs+Ls(101)+Rs+Ls(1 14)+5\$+L\$(1Ø5)+R\$+L\$(111)+R\$+L\$(

100)+R\$+L\$(105)+R\$+L\$(99)

455 TT\$=L\$(84)+R\$+L\$(97)+R\$+L\$(9

8)+R\$+L\$(1Ø8)+R\$+L\$(1Ø1) 460 TV==L\$(111)+R\$+L\$(102)+Q\$+L\$ (116)+R\$+L\$(1Ø4)+R\$+L\$(1Ø1) 465 TR\$=L\$(69)+R\$+L\$(108)+R\$+L\$(101)+S\$+R\$+L\$(109)+R\$+L\$(101)+R\$ +L\$(110)+R\$+L\$(116)+R\$+L\$(115) 47Ø NG\$=L\$(78)+R\$+L\$(111)+R\$+L\$(98)+R\$+L\$(108)+R\$+L\$(101)+I\$+L\$(71)+R\$+L\$(97)+R\$+L\$(115)+R\$+L\$(1 Ø1)+R\$+L\$(115) 475 AM\$=L\$(65)+R\$+L\$(108)+R\$+L\$(107)+R\$+L\$(97)+R\$+L\$(108)+R\$+L\$(105) 48Ø MT\$=L\$(77)+R\$+L\$(1Ø1)+R\$+L\$(116) +R\$+L\$(97) +R\$+L\$(108) +R\$+L\$(115)485 AE\$=L\$(65)+R\$+L\$(108)+R\$+L\$(107)+R\$+L\$(97)+R\$+L\$(108)+R\$+L\$(105)+R\$+L\$(110)+R\$+L\$(101)+I\$+L\$ (69)+R\$+L\$(97)+R\$+L\$(114)+R\$+L\$(116)+R\$+L\$(1Ø4) 49Ø NM\$=L\$(78)+R\$+L\$(111)+R\$+L\$(11Ø)+R\$ 495 OM\$=L\$(79)+R\$+L\$(116)+R\$+L\$(104) + Rs + Ls(101) + Rs + Ls(114)500 TM\$=L\$(84)+R\$+L\$(114)+R\$+L\$(97)+R\$+L\$(110)+R\$+L\$(115)+R\$+L\$(1Ø5)+R\$+L\$(116)+R\$+L\$(1Ø5)+R\$+L\$ (111)+R\$+L\$(11Ø)

NEW

DATA - 500

A FULL FEATURE DATA BASE
•It is menu driven with prompts.

- •500 data lines with up to 3,000 characters per file.
 - •Cassette operated.
- •Runs on 16K TRS-80 color computer.
 - Has many uses household and small business. Keep things organized.

Priced at \$12.00, postage paid. Send check or money order to:



LITEFRAC SOFTWARE INC. 2002 N. MAGNOLIA TUCSON, AZ 85712

Arizona res. add 7% sales tax. TRS-80 is a trademark of the RADIO SHACK CORP.



5Ø5 LA\$=L\$ (76) +R\$+L\$ (97) +R\$+L\$ (1 1Ø) +R\$+L\$(116)+R\$+L\$(1Ø4)+R\$+L\$(97)+R\$+L\$(11Ø)+R\$+L\$(1Ø5)+R\$+L\$(1ØØ) +R\$+L\$(1Ø1) +R\$+L\$(115) 510 AC\$=L\$(65)+R\$+L\$(99)+R\$+L\$(1 16) +R\$+L\$(1Ø5) +R\$+L\$(11Ø) +R\$+L\$(1Ø5)+R\$+L\$(1ØØ)+R\$+L\$(1Ø1)+R\$+L\$ (115): RETURN 515 REM CHECK FOR ELEMENT SYMBOL 520 IFA\$="J"ORA\$="Q"THEN840 525 IFA\$="D"THENX=66ELSEIFA\$="U" THENX=92ELSEIFA\$="V"THENX=23ELSE IFA\$="W"THENX=74ELSEIFA\$="X"THEN X=54ELSE535 53Ø GOT082Ø 535 IFA\$<>"A"THEN55Ø 54Ø GOSUB845: IFA\$="C"THENX=89ELS EIFA\$="G"THENX=47ELSEIFA\$="L"THE

54Ø GOSUB845: IFA\$="C"THENX=89ELS EIFA\$="G"THENX=47ELSEIFA\$="L"THE NX=13ELSEIFA\$="M"THENX=95ELSEIFA \$="R"THENX=18ELSEIFA\$="S"THENX=3 3ELSEIFA\$="T"THENX=85ELSEIFA\$="U "THENX=79ELSE84Ø 545 GOTO82Ø

550 IFA\$<>"E"THEN565

555 GOSUB845: IFA\$="R"THENX=68ELS EIFA\$="S"THENX=99ELSEIFA\$="U"THE NX=63ELSE84Ø

560 GOT0820

565 IFA\$<>"G"THEN58Ø

570 GOSUB845: IFA\$="A"THENX=31ELS EIFA\$="D"THENX=64ELSEIFA\$="E"THE NX=32ELSE840

575 GOT082Ø

58Ø IFA\$<>"L"THEN595

585 GOSUB845: IFA\$="A"THENX=57ELS EIFA\$="I"THENX=3ELSEIFA\$="R"THEN X=103ELSEIFA\$="W"THENX=103ELSEIF A\$="U"THENX=71ELSE840

590 GOT0820

595 IFA\$<>"M"THEN61Ø

600 GOSUB845: IFA\$="D"THENX=101EL SEIFA\$="G"THENX=12ELSEIFA\$="N"TH ENX=25ELSEIFA\$="O"THENX=42ELSE84 0

605 GOT0820

61Ø IFA\$<>"R"THEN625

615 GOSUB845: IFA\$="A"THENX=88ELS EIFA\$="B"THENX=37ELSEIFA\$="E"THE NX=75ELSEIFA\$="H"THENX=45ELSEIFA \$="N"THENX=86ELSEIFA\$="U"THENX=4 4ELSEIFA\$="F"THENX=104ELSE840

62Ø GOT082Ø

625 IFA\$<>"T"THEN64Ø

63Ø GOSUB845: IFA\$="A"THENX=73ELS EIFA\$="B"THENX=65ELSEIFA\$="C"THE NX=43ELSEIFA\$="E"THENX=52ELSEIFA \$="H"THENX=9ØELSEIFA\$="I"THENX=2 2ELSEIFA\$="L"THENX=81ELSEIFA\$="M



"THENX=69ELSE84Ø

635 GOT082Ø

64Ø IFA\$<>"Z"THEN655

645 GOSUB845: IFA\$="N"THENX=3ØELS

EIFA\$="R"THENX=4ØELSE84Ø

65Ø GOT082Ø

655 IFA\$<>"B"THEN67Ø

660 GOSUB845: IFA\$="B"THENX=5ELSE IFA\$="A"THENX=56ELSEIFA\$="E"THEN X=4ELSEIFA\$="I"THENX=83ELSEIFA\$= "K"THENX=97ELSEIFA\$="R"THENX=35E

LSE84Ø

665 GOT082Ø

67Ø IFA\$<>"C"THEN685

675 GOSUB845: IFA\$="C"THENX=6ELSE IFA\$="A"THENX=2ØELSEIFA\$="D"THEN X=48ELSEIFA\$="E"THENX=58ELSEIFA\$="F"THENX=78ELSEIFA\$="L"THENX=17 ELSEIFA\$="M"THENX=96ELSEIFA\$="O"THENX=24ELSE IFA\$="S"THENX=24ELSE IFA\$="S"THENX=55ELSEIFA\$="U"THEN

X=29ELSE84Ø 68Ø GDT082Ø

685 IFA\$<>"F"THEN7ØØ

69Ø GOSUB845:IFA\$="F"THENX=9ELSE IFA\$="E"THENX=26ELSEIFA\$="M"THEN X=10ØELSEIFA\$="R"THENX=87ELSE84Ø

695 GOTO82Ø

700 IFA\$<>"H"THEN715

705 GOSUB845: IFA = "H"THENX=1ELSE

IFA\$="E"THENX=2ELSEIFA\$="F"THENX =72ELSEIFA\$="G"THENX=8ØELSEIFA\$= "O"THENX=67ELSEIFA\$="A"THENX=1Ø5 ELSE84Ø

710 GOT0820

715 IFA\$<>"I"THEN73Ø

720 GOSUB845: IFA\$="I"THENX=53ELS EIFA\$="N"THENX=49ELSEIFA\$="R"THE

NX=77ELSE84Ø

725 GOT0820

73Ø IFA\$<>"K"THEN745

735 GOSUB845: IFA\$="K"THENX=19ELS

EIFA\$="R"THENX=36ELSE84Ø

74Ø GOT082Ø

745 IFA\$<>"N"THEN76Ø

75Ø GOSUB845: IFA\$="N"THENX=7ELSE IFA\$="A"THENX=11ELSEIFA\$="B"THEN X=41ELSEIFA\$="D"THENX=6ØELSEIFA\$="E"THENX=1ØELSEIFA\$="I"THENX=28 ELSEIFA\$="O"THENX=1Ø2ELSEIFA\$="P"THENX=93ELSE84Ø

755 GOT082Ø

760 IFA\$<>"O"THEN775

765 GOSUB845: IFA\$="0"THENX=8ELSE

IFA\$="S"THENX=76ELSE84Ø

77Ø GOT082Ø

775 IFA\$<>"P"THEN79Ø

78Ø GOSUB845: IFA\$="P"THENX=15ELS EIFA\$="A"THENX=91ELSEIFA\$="B"THE NX=82ELSEIFA\$="D"THENX=46ELSEIFA

6809

RECORD MANAGEMENT SYSTEM

RMS

DATABASE MANAGEMENT

RUNS ON THE COLOR WITH FRANK HOGG FLEX

- •USER DEFINED RECORD FORMAT VIA DATA DICTIONARY
- •SCREEN ORIENTED, FORM FILL OUT TYPE OF ACCESS
- •OPTIONAL TWO LEVEL RECORD HIERARCHY
- •ALL FILES IN ASCII TEXT FORMAT, BASIC COMPATIBLE
- •DIRECT ACCESS BY KEY FIELD, MULTIPLE INDEX FILES
- •EXTENSIVE DOCUMENTATION, SAMPLE APPLICATION
- .VERSATILE, PROFESSIONAL QUALITY REPORT WRITER
- .BUILT-IN SORT / MERGE
- ●EASY TO USE

INVENTORY
CONTROL

SORTING

DATA
VALIDATION

MANAGEMENT
INFORMATION

IMMEDIATE
ACCESS

DATA
ENTRY

ORDER
PROCESSING

RMS is a complete DATABASE MANAGEMENT package for the 6809 computer. It is made up of five machine language programs that make up the most powerful business programming tool available for the 6809. It can be used by the relative novice, to implement an incredible variety of information storage and retrieval applications, without any programming. However, the programmer can use RMS as part of the solution to a larger problem, saving many hours of unnecessary program development time. RMS can be used to handle data input, editing, validation, on-line retrieval, sorting and printed reports. Custom data manipulation can be filled in by the user's BASIC programs.

SINGLE CPU LICENSE

FLEX* \$200 OS-9+ \$250 UNIFLEX* \$300

TERMS: VISA / MC / PREPAID

WASHINGTON COMPUTER SERVICES

3028 SILVERN LANE BELLINGHAM, WA 98225 1 (206) 734-8248

* FLEX and UNIFLEX are trademarks of Technical System Consultants Inc.; + OS-9 is a trademark of Microward

\$="M"THENX=61ELSEIFA\$="O"THENX=8 4ELSEIFA\$="R"THENX=59ELSEIFA\$="T "THENX=78ELSEIFA\$="U"THENX=94ELS E84Ø 785 GOT082Ø 79Ø IFA\$<>"S"THEN8Ø5 795 GOSUB845: IFA = "S"THENX=16ELS EIFA\$="B"THENX=51ELSEIFA\$="C"THE NX=21ELSEIFA\$="E"THENX=34ELSEIFA \$="I"THENX=14ELSEIFA\$="M"THENX=6 2ELSEIFA\$="N"THENX=5ØELSEIFA\$="R "THENX=38ELSE84Ø 800 GOTO820 8Ø5 IFA\$<>"Y"THEN84Ø 810 GOSUB845: IFA = "Y"THENX=39ELS EIFA\$="B"THENX=7ØELSE84Ø 815 REM PRINT ELEMENT DATA 820 CLS:PRINT@42,NS\$(X):PRINT@64 +,STRING\$(32,"="):PRINT@1Ø4,"ATOM IC NO.: *";X;"*":PRINT@161,"ATOM .WT.: "; AW\$(X): PRINT@179, "S.G.: "; SG\$(X):PRINT@225,"ION CHARGE:["; IC\$(X);"]":PRINT@242,"ELEC.NEG.: "; EN\$(X): PRINT@295, "OXYDATION NO .: ";00\$(X) 825 PRINT@353, "NO. OF ELECTRONS IN EACH SHELL":PRINT@387,STRING\$ (25, "-"):PRINT@419, "K L М Р Q":PRINT@451,ES\$(X) 0 830 A\$=INKEY\$:IFA\$=""THEN830ELSE IFA\$=" "THEN835ELSE52Ø 835 SCREEN1, Ø: ONZ GOTO105, 115, 12 5, 135, 145, 155, 165, 175, 185 840 CLS0:PRINT@234, "ENTRY ERROR" ;:FORT=1TO400:NEXTT:SCREEN1.0:ON Z GOTO105,115,125,135,145,155,16 845 A\$=INKEY\$:IFA\$=""THEN845ELSE RETURN 850 CLS:PRINT" THE FIRST SCREE N SHOWS THE COMPLETE PERIODIC TABLE. TO SEE THE EIGHT SEP

ARATE CLASSES OF ELEMENTS, SIMP LY PRESS THE spacebar EACH

TIME."

855 PRINT: PRINT" WHEN VIEWING an y SCREEN, YOU MAY RETRIEVE IN

Data base for small inventories, mailing labels, etc. \$15 CALENDAR Disk RS only. One year at a time, up to 100 entries per day. Printer output. \$10 STOCKQUEST

STOCKQUEST Trend Analysis. Buy and sell signals. \$10 STOCKQUEST PLUS* 32K only. Same as above plus STOCKQUEST PLUS* 32K only. Same as above plus printer output.
Capital gain/loss comparisons, forecasting and more. \$15
MUTUAL FUNDS Invest the no-load way. Save money. Shows how to

start, get prospectus and more info on the funds. \$4

DATA MANIA, INC.

Add \$1.50 p/h

Software Dept. 51625 Chestnut Road Granger, IN 46530

*Specify RS Disk or Tape Write for software list/includes Model I/III FORMATION ON any ELEMENT SIM PLY BY TYPING THE ELEMENT'S S YMBOL. ": PRINT 860 PRINT" N.B.: WITH SINGLE-LET TER ELEMENTS, YOU MAY HAV E TO TYPE THE same LETTER TWICE .":PRINT:PRINT" PRESS ANY KEY T O CONTINUE": 865 As=INKEYs:IFAs=""THEN865 870 CLS:PRINT:PRINT" FOR EXAMPLE TO VIEW THE DATA ON HYDROGEN TYPE <HH>. THIS IS ONLY NEC ESSARY WHEN OTHER ELEMENTS SH ARE THE SAME FIRST LETTER. IN OTHER CASES, A SINGLE LETT ER WILL SUFFICE." 875 PRINT" FOR EXAMPLE, TO SEE T HE DATA ON URANIUM, SIMPLY TY PE (U) AS NO OTHER ELEMENT STAR TS WITH THAT LETTER. FOR THE SAME REASON, SOME 2-LETTER WILL REQUIRE THAT ONL **ELEMENTS** Y THE FIRST LETTER BE TYPED IN. " 880 PRINT:PRINT" PRESS ANY KEY TO CONTINUE"; 885 A\$=INKEY\$:IFA\$=""THEN885 890 CLS:PRINT:PRINT" THIS APPLIE S TO ELEMENTS dy AND xe AS NO OT HER ELEMENT SHARES THEIR FIRST LETTERS. ": PRINT 895 PRINT" WHEN VIEWING DATA ON AN ELEMENT YOU MAY RETURN TO THE TABLE BY PRESSING THE spacebar OR YOU MAY ENTER ANOTHER SYM BOL. ": PRINT 900 PRINT" NOTE: A NUMBER IN PAR (ATOMIC WEIGHT) INDIC ENTHESES ATES THE MASS NUMBER OF THE MO ST STABLE ISOTOPE." 905 PRINT@484, "PRESS ANY KEY TO CONTINUE"; 910 As=INKEYs:IFAs=""THEN910 915 CLS:PRINT@41, "ABBREVIATIONS" :PRINT@73,STRING\$(13,"-"):PRINT@ 98, "ATOM.WT. = ATOMIC WEIGHT":PRI NT@162, "S.G. = SPECIFIC GRAVITY": PRINT@226, "ELEC.NEG. = ELECTRONEG ATIVITY" 920 PRINT:PRINT" N.B.: VALUES GIVEN FOR 'ION CHARGE' AND ' OXYDATION NO. ? FOR CERTAIN E LEMENTS ARE THOSE REPRESE NTING THE MOST COMMON OR STA

BLE STATE(S)."

START":

5Ø

925 PRINT@484, "PRESS ANY KEY TO

93Ø A\$=INKEY\$:IFA\$=""THEN93ØELSE

* * Elite Software * *

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

Fly your spaceship through enemy starbases. Can you reach ZAKSUND?

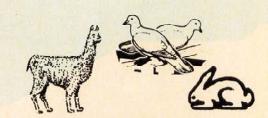
- 3D color graphics
- Fast pace
- Exciting action
- Synthesizer sound
- 2 playing levels
- Machine language 32K

\$24.95 Tape \$27.95 Disc



ARTIFICIAL INTELLIGENCE

Guess the Animal



COLOR COMPUTER WORKSHEET

ELITE CALC is a powerful, full featured worksheet calculator for your Color Computer. The all machine language program will help you answer "what if" questions, prepare reports, maintain records and perform other tasks. Has all the features you want. Individual cell formulas • Copy blocks of cells • Full cell-edit capability • Sorts • Graphs • Easy to use • Works with all printers •

Elite · Calc

THE BEST FOR ONLY
DISC
or TAPE \$4.495

UTILITIES

DISK MANAGER—Copy any program (or file) to another disk with only two key strokes. Kill disk programs with the same ease. All menu driven. A must for disk users. 16K \$22.95 Disk only.

TAPE DUB—Make personal copies of Basic and Machine Language tapes with ease. Completely automatic, menu driven. All machine language. 16K \$19.95 Tape, or \$22.95 Disk.

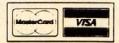
REPEAT KEY—Have your keyboard automatically repeat the key that was held down. It's great when you're typing programs! Position independent code. Machine language. Both 16K and 32K versions for \$14.95 Tape, or \$17.95 Disk.

LLISTER—Would you like to have program listings that "page break". How about program listings with nice margins? Works with any printer. Machine language. 16K \$14.95 Tape, or \$17.95 Disk.

SHRINK—Eliminate all unnecessary spaces from any Basic program. Get more program into your memory. Machine language. 16K \$14.95 Tape, or \$17.95 Disk.

Shipping from stock NOW

Dealer inquiries invited



artificial intelligence program for the Color Computer. You must play it to believe it. Think of an animal, and this software will try to guess it using your clues. Watch this program learn, and use your clues. See it respond with questions. The longer you play, the smarter this program becomes. 16K \$17.95 Tape, or \$20.95 Disk. (Both Animals and Body Parts \$24.95 Tape, or \$27.95 Disk.)



Have fun with artificial intelligence. This take-off on Animals is a riot. See if this program can guess the body-part you have in mind. The program learns, and responds with questions. If you give it x-rated clues, it turns into Bawdy Parts. 16K \$17.95 Tape, or \$20.95 Disk. (Body Parts and Animals \$24.95 Tape, or \$27.95 Disk.)

COLOR TUTOR—An exceptional program for Language, History, Math and Vocabulary drills. You enter questions and answers. Program randomizes, presents questions, keeps lesson score. Store lessons for future use. Excellent for you or your children. 16K Ext. Basic \$19.95 Tape, or \$22.95 Disk.

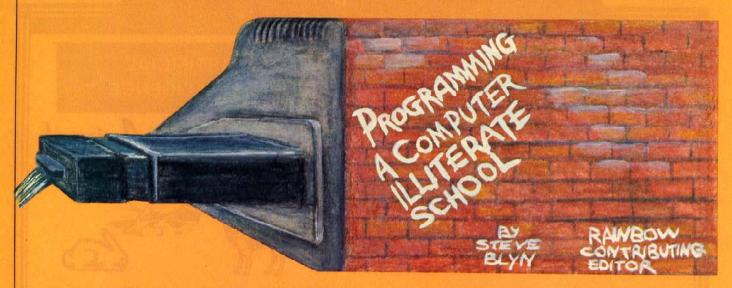
LOAN PAYMENT CALCULATOR—A fast and easy way to calculate what a monthly loan payment will be. Amount of loan, interest rate and length of loan are displayed; along with your calculated monthly payment. You change any item, and your new monthly payment is displayed. Output to a printer if desired. If you are going to buy a new car, stereo, or house ... this program was written for you. 16K Ext. Basic \$17.95 Tape, or \$20.95 Disk.

- Add \$1 Postage and Handling
- PA residents add 6% sales tax

EDUCATION NOTES

16K ECB





any of you readers as well as some of my teaching colleagues have asked what one teacher can do to help introduce computers to his local school. I will share in this month's article some of my own personal experiences in the hope that you will be getting some additional ideas and be inspired to use your resources to help spread the computer revolution.

The junior high school that I teach in is located in the famous Flatbush area of Brooklyn, New York. This is the neighborhood that the movie "Sophie's Choice" was filmed in. Although built to accommodate 1,200 students, the building now houses over 1,700. The students are of diverse ethnic backgrounds: Over 70 percent of the students are minority students. The neighborhood still retains its famous middle-class character.

This story starts in January, 1982. My junior high school was still in the Computer Dark Ages. Not only were there no computers in the school yet, but there were no plans to acquire any. None of the math teachers owned or planned to own home computers. I was the only one interested in this field, but I am a Special Education teacher. What, you ask, could one person do alone?

I am, however, in a unique position in the school. I have been teaching Special Education here for 13 years, am friendly with many of the 100-plus teachers, and have the full cooperation and mutual respect of all of the administrators. I am therefore able to try innovative ideas and introduce new projects with no difficulty. Although my license would not permit me to teach computer literacy full time in the school, I felt that I could influence the actions of others.

It has long been obvious to me that a mathematical equation exists between the amount of experience a teacher or administrator has and his degree of resistance to change. This is not meant to cast aspersions on these professionals. I am part of them and know that it is merely the result of their

(Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)

being witness to many "unique cure-alls" over the years that often amounted to a waste of time only to be replaced by another magic "cure-all."

I realized that it would be necessary to enlist the aid of many of the other experienced professionals on the staff to introduce some sort of computer program to the school. Direct didactic methods would not stand a chance either by me or the administrators. I was certain that computers could not be forced upon this professional staff. Another, more humanistic approach would have to be taken.

An open door policy would have to be established by myself, with the principal's consent, to create an awareness of a computer's potential as a teaching aid in our school.

I decided to start out slowly: Let's not overwhelm or scare anyone off early in the game. I requested permission of the principal to bring my TRS-80 Color Computer to school on a once a week basis. I used some of the educational software that I have developed at home as learning material for my students. Computer programs or software that help to reinforce teaching are known as Computer Assisted Instruction (C.A.I.).

My class is the Special Education Resource Room at this school. I teach small groups of learning disabled students. The students immediately saw the computer to be a novel way of learning new and reviewing old material. They enjoy using the C.A.I. materials and several have even begun to read and write very simple programs. They, of course, love to read each new issue of the Rainbow.

Each of the assistant principals, the principal, the special education supervisor of the district, the school's guidance counselors, and the P.T.A. president were invited separately to view these lessons. Teachers were invited to drop in at their convenience any time on any Friday. Friday soon became known as Computer Day in my Resource Room and to a number of the staff in the school.

Two of the school's math teachers took an immediate liking to the computer. They came to visit every Friday and quickly grasped the possibilities for its use with math classes. By coincidence, the school was given some money by the district in March. This money had to be spent immediately

by the math department. They decided to use the money to buy computer equipment.

Unfortunately, I could not in good conscience recommend to them the purchase of CoCos at that time. There was a scarcity of educational software on the market, no Network, and a new and unproven disk drive. I therefore suggested that they use their money to begin with four TRS-80 Model III computers, one disk drive and a printer. There was much software available for the Model IIIs then.

The equipment was ordered and arrived quickly. There was, however, no way that the math department could begin a program with the computers and students in the middle of a term. It was decided that the two math teachers who were interested in computers and the principal would take these computers home until September to practice and learn more about them. The fourth computer with the disk drive and printer would be placed in my Resource Room for the rest of the term.

This represented a big opportunity for me to involve more people in computers. I thanked the school for lending my class the computer and volunteered to teach a group of

students from the school's math team about computers.

These students were the very brightest math students in our school. We met each day during my preparation period and their lunch period. They quickly learned how to operate the computer, disk drive and printer and how to save and load in programs. This is referred to as computer literacy. I also began to teach this group simple programming commands and routines. This was an introduction for them into real programming. They soon picked up enough elementary programming ability and the skills to begin to write simple programs on their own as a group.

I also volunteered to write some programs which would generate class lists for the school. This would be a large time saver for many people as it is very

difficult to keep track of all the kids in the school. The computer could easily print lists of children by official class, subject class, minor groups, shops and many other ways. Just about everyone volunteered to type in the data in order to gain experience with the "new toy." This acted as the school's introduction to data processing programs.





This data program actually served to win over more advocates for computers than all of my teaching efforts. The assistant principals, deans, counselors, attendance teacher and several other people with administrative jobs quickly saw the advantage of such lists to make their jobs easier. After all of the pupils' names were entered into the program,

lists were generated on the printer and given to anyone who needed them. Many teachers used these lists to help them enter their final grades.

By the opening of the fall term in September, 1982, the P.T.A. had already decided to contribute the money for four more Model III computers and a Network. This meant that there were now eight computers available for a single classroom. The Network allows the teacher to upload and download programs from the disk computer to the other seven computers. This equipment was clearly enough to really begin a computer literacy course for entire classes. One of the math teachers who had borrowed a computer over the summer became the teacher of this class. I willingly helped out with some demonstration lessons. Since Septem-

ber, five classes a day have been successfully receiving computer literacy and programming instruction.

Just before the summer, our Gates program received a sum of \$2,000 to spend on instructional materials. The Gates program has remedial classes for children who are below grade level in reading or math. The assistant principal in charge of this program decided to spend that money on computers. More software and peripherals had been put on the market by then and I recommended that they purchase three TRS-80 Color Computers, three black and white monitors and one printer. I recommended TRS-80 Color Computers for them because of the inexpensive price, and the musical and graphic capabilities of this computer. Also, I had developed much educational software which I would donate to their program. The computers arrived just before summer vacation. They were also taken home over the summer by several teachers to practice and get a head start on learning the possibilities of their new machines.

In the fall, the Gates program began to use their computers. They concentrated mainly on C.A.I. reading programs and word processing. The reading programs were modifications of the ones that I was using in the Resource Room.

CoCo HEADQUARTERS

Looking to unlock the capacity of your Color Computer?
Search no more.....

TOLL FREE 1-800-251-5008





SPECIALS

Extended Basic	\$ 69.95	Super Pro Keyboard Kit	\$ 69.95
32/64k Memory	\$ 69.95	26-3016 Keyboard Kit	\$ 34.95
R/S Disk Controller	\$189.95	26-3026 Color Computer 2 16k	\$ 214.95
1.1/1.2 Basic ROM	\$ 29.95	26-3027 Extended CoCo 2 16k	\$ 289.95
Amdek Disk Drives	\$569.95	26-3003 64k Extended CoCo	\$ 359.00
26-3011 MC-10 CoCo	\$104.95	26-1261 TP-10 Thermal Ptr.	\$ 89.95
26-3013 16k for MC-10	\$ 44.95	26-1192 CGP 115 Printer	\$ 179.95
26-3022 CoCo Drive 0	\$349.95	C. Itoh Banana 50 cps Ptr.	\$ 249.95
26-3029 CoCo2 Drive 0	\$369.95	26-1268 CGP-220 Color Ptr.	\$ 639.95
26-3023 Drive 1	\$249.95	26-3024 Multi-Pac Interface	\$ 159.95

ACCESSORIES

26-3020 Cable	\$ 5. 29	Hayes SM1 200 Modem	\$ 579.95
Kraft Joystick	\$ 49.95	USR AL 212 (300/1200)	\$ 495.00
Wico Track Ball	\$ 59. 95	Hayes SM 300 Modem	\$ 239.00
Wico Joystick	\$ 29.00	R/S D.C. Modem 2	\$ 215.00
Wico Adapter	\$ 19.95	USR AL300	\$ 199.00
Verbatim Disks	\$ 27. 95	R/S D. C. Modem 1	\$ 129.00
Elephant Disks	\$ 25.00	Hayes/USR Cable	\$ 19.00

SOFTWARE

MSI DATABASE	\$ 39.95	(Disk)	MSI Color Finance	\$ 59.95	(Disk)
Sea Dragon (32k)	\$ 34.95	(C or D)	Telewriter 64	\$ 59.95	(Disk)
The Grabber (32k)	\$ 34.95	(cass)	Telewriter 64	\$ 49.95	(Cass)
Space Shuttle	\$ 28.95	(Cass)	Zaxxon by Sega	\$ 34.95	(C or D)
Colorpede	\$ 29.95	(Cass)	The King by Tom Mix	\$ 27.95	(Cass)
Mark Data Adventures	\$ 24.95	(Cass)	The Frog by Tom Mix	\$ 27.95	(Cass)
Ghost Gobbler	\$ 19.95	(Cass)	Trapfall by Tom Mix	\$ 27.95	(Cass)

**** All TRS-80 Software 10% off list *****

Call for prices and availability of your other favorite software advertised in The Rainbow.

All advertised items subject to availability

TeleCheck

FREE

TOLL

TENNESSEE Prices do not include shipping

1-800-251-5008

1-800-545-2502

TOLL

FRFF

All of the above units covered by our 120 day carry in warranty. (d) denotes "Delker" (200ns) memory guaranteed for 1 year. TRS-80 Trademark Tandy Corporation. Prices subject to change without notice.







(DEALER INQUIRIES WELCOME)
DELKER ELECTRONICS, INC.
P.O. BOX 897
DEPT D
SMYRNA, TN 37167
800-251-5008
615-459-2636 (TENNESSEE)

Write for our FREE newsletter!

They were also very interested in using the word processor and printer as a means of putting out better class magazines. Since the students are obtaining much more professional looking results, their stories and articles are becoming both longer and better.

Since the Gates classes were not using their computers on a regular basis, they were kind enough to let one reside in my room. This, of course, again saved me the trouble of bringing in my own computer. The assistant principal of this program was so impressed with the Color Computer that he bought one for his own personal use at home.

All proceeded on this course until March. The school received some unexpected funds and the principal decided to let the Resource Room have its own computer. A TRS-80 64K Color Computer and disk drive were purchased. My mother always says, "when it rains, it pours." As an added bonus to my class's program, one of the original math teachers was kind enough to donate a used color television to my class for use as a monitor. After demonstrating and using my Color Computer in school for over one year with a black and white television, I could finally utilitize the color capabilities. Color, of course, adds a pleasant extra motivational factor to all of the programs.

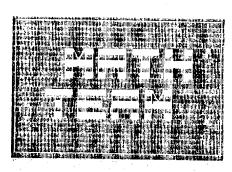
The school's principal and the program office chairman were both very impressed throughout this entire period by the data processing abilities of computers. The program office is the place that figures out teacher, class, room, lunchtime, shop and many other teacher and student schedules. They asked many questions about the possibilities of a computer becoming an aid to programming and printing many of the repetitive and administrative tasks in the school. The principal told the local school board of his desire to purchase a computer to help alleviate and quicken much of the office work.

The school board was so impressed with this idea that they appropriated enough money to purchase a very sophisticated computer system. An IBM computer with one hard and two floppy disk drives and a printer have recently been ordered for administrative purposes. Several special software packages to do advanced word processing and to create data bases have also been ordered. We expect to have this equipment up and running by September, 1983.

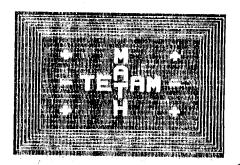
I feel that the method of approaching the original problem was correct. If I, or anyone else, had tried to force the introduction of computers into our school in a dogmatic or threatening fashion, there would have been much resistance. The "let's do it together" approach that I took and the willingness of the principal to let many faculty members borrow the equipment over the summer vacation were both very important and successful ideas.

We now have successful computer programs on several levels. Our school is no longer computer illiterate. I feel much personal satisfaction in the part I played and continue to play in this situation.

I have included three short programs written by several members of the eighth grade math team. We had been working together for almost a year and decided to have a contest to create a logo for their team. Although very bright, these students are not too advanced in the use of high resolution graphics because of their limited access time to the computer. I taught them the uses of the line command and let them use their abilities to create the programs that follow. The results are especially pleasing to me as none of these kids have a home computer of their own on which to practice.







Listing 1:

240....023D 430....0446 END...069E

10 REM"TORI" 20 PCLS:SCREEN 1,1:PMODE 4,1 30 COLOR 7 40 FOR Y= 1 TO 8 50 LINE(4+T,4+T)-(253-T,188-T),P SET, B 60 T= T+4 70 NEXT Y 80 LINE (60,52)-(64,64),PSET,BF 90 LINE(56,56)-(68,60), PSET, BF 100 LINE (56,94) - (68,98) , PSET, BF 110 LINE(60,128)-(64,140),PSET,B 120 LINE (56,132)-(68,136), PSET , BF 130 LINE(192,52)-(196,64), PSET, B 140 LINE (188,56)-(200,60),PSET, BF 150 LINE (188,94)-(200,98),PSET, BF 160 LINE(192, 128) -(196, 140), PSET 170 LINE(188,132)-(200,136),PSET .BF

180 LINE(120,48)-(124,68), PSET, B

```
19Ø LINE (132,48)-(136,68),PSET,
200 LINE(124,48)-(128,56),PSET
210 LINE(124,60)-(124,64), PSET
220 LINE(128,56)-(132,48),PSET
23Ø LINE (128,64)-(132,6Ø),PSET
24Ø LINE(124,6Ø)-(128,64),PSET
250 PAINT (128,60),7,7
260 LINE(120,76)-(124,92), PSET, B
27Ø LINE(132,76)-(136,92),PSET,B
280 LINE(124,80)-(132,84),PSET,B
29Ø LINE(124,72)-(132,76),PSET ,
300 LINE (120,76)-(124,72),PSET
310 LINE(124,78)-(126,76),PSET
320 LINE (130,76)~(132,78),PSET
330 LINE(132,72)-(136,76),PSET
340 LINE(120,96)-(136,100),PSET,
350 LINE(126, 100) - (130, 116), PSET
360 LINE(120,120)-(124,140),PSET
, BF
370 LINE(120,128)-(136,132),PSET
,BF
38Ø LINE(132,12Ø)-(136,14Ø),PSET
, BF
39Ø LINE(8Ø,86)-(96,9Ø),PSET,BF
400 LINE(86,86)-(90,106),PSET,BF
410 LINE(100,86)-(104,106),PSET,
420 LINE(100,86)-(116,90),PSET,B
430 LINE(100,94)-(112,98),PSET,B
440 LINE(100,102)-(116,106),PSET
, BF
450 LINE(144,86)-(150,90),PSET,B
46Ø LINE(152,88)-(156,106),PSET,
470 LINE(140,88)-(144,106),PSET,
480 LINE(140,94)-(156,98),PSET,B
490 LINE (152,86)-(156,88),PSET
500 LINE(140,88)-(144,86),PSET
510 LINE(144,92)-(146,90),PSET
520 LINE(150,90)-(152,92), PSET
53Ø LINE(16Ø,86)-(164,1Ø6),PSET,
540 LINE(172,86)-(176,106),PSET,
550 LINE(164,86)-(168,92),PSET
560 LINE (168, 92) - (172, 86), PSET
570 LINE(154,98)-(168,102),PSET
580 LINE(168, 102) - (172, 98), PSET
```

590 PAINT(167,95),7,7
600 LINE(122,74)-(134,74),PSET
610 LINE(122,75)-(134,75),PSET
620 LINE(142,87)-(152,87),PSET
630 LINE(144,86)-(152,86),PSET
640 LINE(144,88)-(152,88),PSET:L
INE(144,89)-(152,89),PSET:LINE(1
44,90)-(152,90),PSET
650 GOTO650

170 0282

END... 052E

Listing 2:

10 REM"BOB" 20 PCLS:SCREEN1,1:PMODE4,1 3Ø COLOR 7 40 LINE(24,16)-(24,56), PSET: LINE -(36,56),PSET 50 LINE(36,56)-(36,36),PSET:LINE -(48,48), PSET:LINE-(60,36), PSET 60 LINE(60,36)-(60,56),PSET:LINE -(72,56), PSET:LINE-(72,16), PSET: LINE-(60,16), PSET 70 LINE(60,16)-(48,28), PSET: LINE -(36,16), PSET: LINE-(24,16), PSET 8Ø PAINT(64,28),3,7 90 LINE(80,24)-(80,56), PSET:LINE -(92,56), PSET: LINE-(92,44), PSET 100 LINE(92,44)-(104,44),PSET:LI NE-(104,56), PSET: LINE-(116,56), P SET 110 LINE(116,56)-(116,24), PSET:L INE-(104, 16), PSET: LINE-(92, 16), P SET:LINE-(80,25), PSET 120 LINE (92, 36) - (104, 36), PSET: LI NE-(104,32), PSET: LINE-(99,27), PS ET:LINE-(92,32), PSET:LINE-(92,36), PSET 130 PAINT(93,37),3,7 140 DRAW "BM124,16;R39;D13;L13;D 29;L13;U29;L13;U13" 150 PAINT(130,20),3,7 160 DRAW"BM168,16;R13;D17;R17;U1 7;R13;D41;L 13;U17;L17;D17;L13; U41" 170 FAINT(176,28),3,7 180 DRAW"BM28,72;R39;D13;L13;D29 ;L13;U29;L13;U13" 190 PAINT (48,80),3,7 200 DRAW"BM72,80;R30;D13;L13;D5; R9; D9; L9; D5; R13; D13; L29; U45" 210 PAINT (84,90),3,7 220 DRAW"BM108,100;D30;R12;U17;R 16; D17; R12; U3Ø" 230 LINE(148, 100)-(136,88), PSET: LINE-(120,88), PSET: LINE-(108,100), PSET 24Ø DRAW"BM12Ø,1ØØ;D5;R16;U5" 250 LINE(136,100)-(132,96),PSET:

FHS

federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER AND TDP-100

Coco-Accountant II

We've turned a fine accounting program into a great accounting program for the home or small business. The all-new Coco-Accountant II provides everything you need to keep track of your finances and make income tax time a breeze. Spend a few minutes every month with your canceled checks, credit card bills, cash receipts and payroll stubs. Data entry is quick and painless. When you're through, Coco-Accountant II will list and total expenditures and income by month, account or payee, provide a year-to-date summary by account and figure your net cash flow. Better yet, it will provide a printed spreadsheet to show your year at a glance.

The program sorts entries by date, lists most functions to screen or printer and saves your files to tape or disk. A special feature flags tax deductible expenses and expenses subject to state sales tax. It even computes the sales tax you paid. In addition, COCO-ACCOUNTANT II includes a separate program to balance your checkbook the easy way and print a reconciliation statement. Up to 450 entries per file on 32K tape version, 500 per file on 32K disk and 750 on 64K disk version. For 16K Coco owners we have a simpler program that tracks expenses only, without the tax options. It will handle 200 entries per file. All versions are easy to use and menu-driven and come with complete documentation. And here's the best partthe price! Coco-Acountant II is only \$21.95 on tape, \$24.95 on disk.

Play Blackjaq!

This is as close as you can come to the real thing without losing your shirt! A full casino simulation, with up to 5 players and 9 decks. The computer plays vacant hands by card counting rules, keeps track of everybody's winnings and losings, displays two card-counting algorithms and even prints out the results of every hand if a printer is on line!. Great for the beginner or experienced player. Use it at home for fun or brush up on your technique before hitting Atlantic City or Las Vegas. Requires 16K Ext. Bas. Only \$19.95 on tape, \$24.95 on disk.

Kokomath!

Teachers and parents: Are your kids bored by dull educational programs? Let KOKO the Math Clown make arithmetic a joy. KOKO gives your youngsters 10 math problems. If they get them all right, they give KOKO a bath! He keeps track of their score. Add, subtract, multiply an divide at three levels of difficulty. Colorful graphics and music make this a kid-tested winner! Includes both Extended and Standard Basic Versions. Only \$8.95

To order programs, send check or money order to FEDERAL HILL SOFTWARE, 825 William St., Baltimore, MD 21230. Your personal check is welcome—no delays. Add \$1.50 per order for postage and handling.

64K Breakthrough!

Did you feel gypped when you found out your "64K" computer still had the same old 32K in Basic? We sure did. So we've developed HID 'N RAM, a program that will access that "hidden" 32K from Basic and use it for data storage. Imagine writing a 28K data handling program with every bell and whistle you can think up and still having 32K left for the names, numbers and addresses you're crunching! HID 'N RAM is a brief ML driver embedded in a Basic demonstration program (a mailing list) that shows you how to store your data in the "other" 32K and access it using regular Basic commands. When you see how it works, you can delete our program and write your own. The ML driver stays with the program! Use it from tape or disk. What's the catch? There's only one. Your data must be in strings of equal length—which the program takes care of—and that length must be a power of 2 (such as 8, 16, 32, 64 or 128 bytes). Of course, you must have a 64K computer. Comes with complete documentation. HID 'N RAM is only \$19.95 on tape, \$24.95 on disk.

The Handicapper

Use the power of you Color Computer to improve your performance at the track! The Handicapper is two separate programs for thoroughbred and harness horses that apply sound handicapping techniques to produce rankings for the horses in each race. Factors include speed, distance, track condition, post position, past performance, jockey or driver's record and other attributes. With a little practice, you can handicap an entire race in a few minutes and a whole card in less than an hour! Easy enough for the beginner, sophisticated enough for the veteran horseplayer. Cassette comes with both Extended and Standard Basic versions. Includes complete documentation and betting guide. Thoughred or Harness Handicapper, \$24.95 each on tape. \$29.95 disk. Both programs only \$39.95 tape or disk.

Printer Artist

This unique printer utility introduces the Color Computer to the little known but delightful craft called "Artyping." This is the art of creating pictures using typewritten characters, and Printer Artist puts it at your fingertips. It includes two programs with 12 ready-to-run drawings of of ships, birds and animals, holiday and patriotic themes, famous Americans and more. In addition, there are two utility programs and instructions for 40 additional drawings. Create your own file of printer art and save it to tape or disk. Complete documentation. Fun for home or classroom. Only \$19.95 on tape, \$24.95 on disk. Requires Ext. Bas.

LINE-(124,96), PSET: LINE-(120,100), PSET 260 PAINT (128, 92), 3,7 27Ø DRAW"BM168,96;L12;D41;R12;U2 1" 280 LINE(168,116)-(180,128), PSET :LINE-(192,116),PSET 29Ø LINE(168,96)-(18Ø,1Ø8),PSET: LINE-(192,96), PSET 300 DRAW"BM192,96;R12;D41;L12;U2 1" 310 PAINT(196,116),3,7 320 LINE (28, 120) - (28, 160), PSET:L INE-(204,160), PSET: LINE-(28,120) , PSET 33Ø PAINT(56,144),3,7 340 LINE(5,5)-(250,186),PSET,B 350 LINE(10,10)-(245,181),PSET,B 360 PAINT (7,7),3,7 370 FOR T= 1 TO 4:CIRCLE(232,36) , Y: Y=Y+4: NEXT 380 GOTO 380

240 0247 430 0481 Listing 3: END... 06D2 10 REM "J&E" 20 PCLS:SCREEN 1,1:PMODE 4,1 30 CLS 40 LINE (64,44)-(72,52), PSET, BF 50 LINE(88,44)-(96,52), PSET, BF 60 LINE(104,44)-(136,52),PSET,BF 70 LINE(144,44)-(176,52),PSET,BF 80 LINE(184,44)-(192,52), PSET, BF 90 LINE (208, 44) - (216, 52), PSET, BF 100 LINE(64,60)-(96,68), PSET, BF 110 LINE(104,60)-(136,68), PSET, B 120 LINE(156,60)-(164,68),PSET,B 130 LINE(184,60)-(216,68), PSET, B 14Ø LINE(64,76)-(72,84),PSET,BF 150 LINE(88,76)-(96,84), PSET, BF 160 LINE(104,76)-(112,84),PSET,B 170 LINE(128,76)-(136,84), PSET, B 18Ø LINE(156,76)-(164,84),PSET,B 190 LINE (184,76) - (192,84), PSET, B 200 LINE(208,76)-(216,84),PSET,B 210 LINE(64,52)-(72,60), PSET, B 220 LINE(88,52)-(96,60), PSET, B 23Ø LINE (104,52)-(112,60),PSET,

260 LINE(184,52)-(192,60), PSET, B 27Ø LINE(2Ø8,52)-(216,6Ø),PSET,B 28Ø LINE(64,68)-(72,76),PSET,B 29Ø LINE(88,68)-(96,76 T,B 300 LINE (104,68)-(112,76),PSET, 310 LINE(128,68)-(136,76),PSET,B 32Ø LINE(156,68)-(164,76),PSET,B 33Ø LINE(184,68)-(192,76),PSET,B 340 LINE(208,68)-(216,76),PSET,B 350 LINE(72,44)-(80,60),PSET:LIN E -(88,44),PSET 360 LINE (40, 100) - (72, 108), PSET, B 370 LINE(80,100)-(112,108),PSET, BF 380 LINE (120,100)-(152,108),PSE T, BF 390 LINE(160,100)-(168,108),PSET ,BF 400 LINE(184, 100) - (192, 108), PSET 41Ø LINE(52,116)-(60,124), PSET, B 420 LINE(80,116)-(108,124),PSET, 43Ø LINE(12Ø,116)-(152,124),PSET 440 LINE(160,116)-(192,124),PSET , BF 450 LINE(52,132)-(60,140), PSET, B 460 LINE(80,132)-(112,140), PSET, BF 470 LINE(120,132)-(128,140), PSET , BF 480 LINE(144,132)-(152,140),PSET ,BF 490 LINE(160,132)-(168,140),PSET , PF 500 LINE(184,132)-(192,140),PSET 510 LINE(52,108)-(60,116),PSET,B 520 LINE(80,108)-(88,116),PSET,B 530 LINE(120,108)-(128,116), PSET ,B:LINE(144,108)-(152,116),PSET, B:LINE(160,108)-(168,116), PSET, B :LINE(184,108)-(192,116),PSET,B 540 LINE(52,124)-(60,132),PSET,B :LINE(80,124)-(88,132),PSET,B:LI NE(120,124)-(128,132), PSET, B:LIN E(144,124)-(152,132), PSET, B: LINE (160,124)-(168,132), PSET, B:LINE(184,124) - (192,132), PSET, B 550 LINE(168, 100) - (176, 116), PSET :LINE-(184,100),PSET 560 LINE (4,4)-(252,188), PSET, B 570 GOTO 570

240 LINE(128,52)-(136,60), PSET, B

25Ø LINE(156,52)-(164,6Ø),PSET,B

"My Radio Shack Micro Color Computer Has Incredible Power and Performance."

It's easy to start computing with the new Model MC-10 from Radio Shack. Affordable, too. Only \$119.95.

"Don't let the price fool you, this is no toy." The MC-10 is a real computer with over 4000 characters of expandable internal memory. Use our ready-to-run software or learn to program in our popular Micro Color BASIC.

"With the touch of a few keys, I can create spectacular color graphics." And sound effects too! Eight vivid colors come alive on your TV screen. And the MC-10 has a 47-key typewriter-style keyboard with real keys—not just a printed plastic overlay.

"Imagine the incredible learning potential of this powerful computer!" Whether you're a beginner or a serious computer hobbyist, the MC-10 won't leave you short. It features 16 lines of 32 upper case characters, a cassette port, and a serial port. Add our optional modem and software and access news and information from CompuServe" or Dow Jones News/Retrieval". You can even add a printer For larger applications, just plug-in our optional 16K RAM Module

(26-3013 \$49.95) for an

additional 16,000 char-

acters of memory.

"Be prepared for the future." The computer age we once only read about is now upon us. Find out how simple and uncomplicated using a computer can be with the MC-10. Our comprehensive 133-page tutorial manual is written to get the beginner started fast.

"I can depend on Radio Shack's nationwide sales and service."

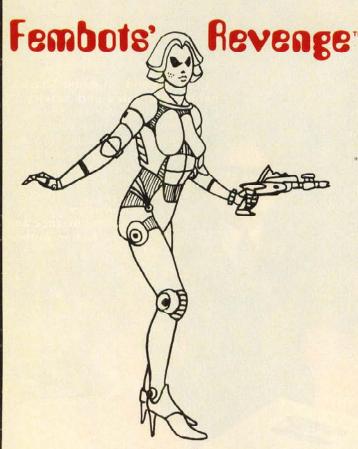
Stop by your nearest Radio Shack Computer Center, participating store or dealer and ask to see the all-new TRS-80 Micro Color Computer (Cat. No. 26-3011).

Isaac Asimov
 Renowned Science and
 Science Fiction Author



ColorQuest GAMES For The TRS-80 Color and TDP System 100

Fast Machine Code • Hi-res Color Graphics • Exciting Arcade Action and Sound

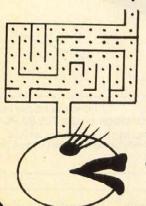


3-D GRAPHIC ADVENTURE

Make love not war? Not with these sultry FEMBOTS! What a tale you'll tell IF you live to tell it! Cold steel never felt so HOT! The color and excitement of ARCADE ACTION combined with the sophistication, intellectual challenge and skill of an ADVENTURE GAME doesn't fully describe this cosmic shoot'em up.

16K Tape \$29.95

32K Disk \$34.95



by Tom Czarnecki

The ONLY Ms. game around. A must for your PAC-like game collection.

> 16K Tape \$19.95 16K Disk \$24.95

TRS-80 is a trademark of Tandy Corp.

BEYOND THE CIMEEON MOON™

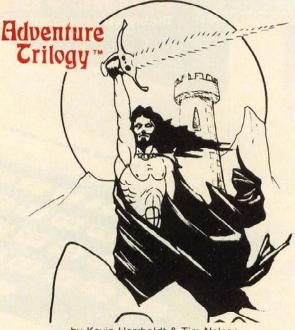


by Kevin Herrboldt & Tim Nelson **3-D GRAPHIC ADVENTURE**

A dead star . . . A derlict vessel . . . or is it? Trapped within you must venture the corridors; defend yourself against the merciless gauntlet of agents of the machine mind. A real-time, high-res, 3-D science fiction adventure game of mind-blowing magnitude.

16K Tape \$24.95

32K Disk \$29.95



by Kevin Herrboldt & Tim Nelson 3-D GRAPHIC ADVENTURE

Clash steel with thy foe in the arena of gore. Proved worthy, go in guest of the elusive Eve of Dazmor. If ve findest the orb, hast ye the might to ward off skem and the fortitude to restore the Eye? The ultimate high-res. 3-D quest for even the most experienced adventurer!

16K Tape \$24.95

32K Disk \$29.95

For Orders ONLY Call Toll Free 1-800-328-2737

Fast Machine Code • Hi-res Color Graphics • Exciting Arcade Action and Sound

INTERCEPTOR

by Scott Snyder

Goes beyond "DEFENDER" and "STARGATE" to offer the most realistic ARCADE simulation possible. Warp speed action, multi-colored terrain and long-range viewer make this game tops.

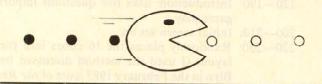
16K Tape \$19.95 32K Disk \$24.95





Why fly to VEGAS when you can have a casino at home! The VEGAS GAMEPAK is five action packed games with great graphics & sound. SLOT MACHINE -BLACKJACK - UP AND DOWN THE RIVER - CRAPS & KENO.

16K Tape \$19.95 16K Disk \$24.95



by Tom Czarnecki

Fast paced maze chase game will entertain the entire family.

16K Tape \$19.95 16K Disk \$24.95

ColorQuesi

A Division of Softlaw Corp. 9072 Lyndale Ave. So., Minneapolis, MN 55420

AUTHORS' SUBMISSIONS ARE ENCOURAGED

Available at Dealers everywhere. If you Dealer is out of stock ORDER DIRECT!



Shades of smartbombs and hurtling comets! Defending your planet from invasion was never so challenging. Disruptor fire is your main defense against the fierce alien

16K Tape \$19.95

32K Disk \$24.95

ORDERING

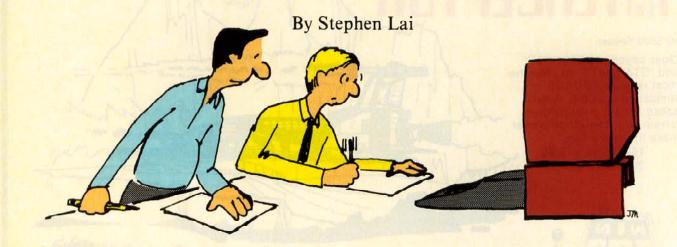




Order status and product support call (612) 881-2777 Make checks or money orders payable to Nelson Software Systems. Personal checks allow 3 weeks. MAIL ORDERS: \$2.00 U.S. Shipping (\$4.00 CANADA \$10 OVERSEAS) Add \$2.00 for C.O.D.



Boggle Clone Demands Concentration



A fter playing several rounds of Boggle, a popular word game made by Parker Brothers, with my friends and family, I decided to write a program patterned after it. In the process I learned much about arrays, bubble sorting and randomizing.

Each player will need a pencil and paper to play this game. Three minutes are given for one to eight players to find as many hidden words as possible in a 4 x 4 layout of randomly selected letters. Words are formed by linking horizontally, vertically, and diagonally adjacent letters together. No single letter may be used more than once, but if two identical letters are both located in the layout, both may be used. Any word that can be found in a standard English dictionary may be used, with the exception of proper nouns and words of less than three letters.

More thorough instructions are provided in the program. Instead of using DRAW statements to produce the 26 letters of the alphabet on the graphics screen, I used data which is POKEd into the appropriate memory locations on the screen. I picked the black/green mode over the black/buff mode to make the undocumented colors more inconspicuous.

Here is a detailed description of the program, line by line:
LINES DESCRIPTION

10: Sets up arrays for graphic representation of the 26 letters of the alphabet (AZ), the 16 six-lettered cubes (CB\$) and the 16 cells in which the cubes will be randomly placed.

(Stephen Lai is a high school freshman in Palatine, Illinois. His primary interests are the color computer, jogging, tennis, and carnivorous plants.)

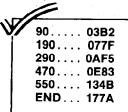
- 20: Sets graphic screen to highest resolution; clears the screen black; skips over lines 30—80 to get to line 90
- 30—40: Subroutine that waits for the user to depress the "ENTER" key.
- 50-70: DATA for the AZ array.
 - 80: DATA for the CB\$ array.
 - 90: READs the data from lines 50-80.
- 100—110: Sets up DRAW statements for "1 MINUTE,"
 "30 SECONDS," "10 SECONDS," and "ADD
 UP POINTS."
- 120—190: Introduction: asks five questions important to game play.
- 200-210: Initial screen set up.
- 220—230: Randomly places the 16 cubes into the 4 x 4 layout (I used the method discussed by Steve Blyn in the February 1983 issue of *the Rainbow*, pages 14—16); displays graphics screen, initiates the three minute timer.
- 240—320: Timer runs; subroutines appropriately executed to display and erase signals that warn players that one minute, 30 seconds, and 10 seconds are left for finding words.
- 330—340: Buzzer SOUNDs to signal that the three minute time limit has expired; players are told to ADD UP POINTS; the computer waits for the "ENTER" key to be pressed.
- 350—370: Asks each player the amount of points earned in the round; adds this to the total from all previous rounds; the computer checks to see if anyone has equalled or surpassed the specified score or if the specified number of rounds has been played, depending on the INPUTted choice.

380—410: Displays everyone's updated scores.

420: Players are informed that another round is to be played; a GOTO 220 starts the formation of a new random layout.

430—490: Final scores are displayed, from highest to lowest using a bubblesort; players are asked whether or not they wish to play another game.

500—630: Instructions; uses the subroutine located at lines 30—40 to flip seven pages of text onto the screen.



The listing:

10 DIMAZ(25,13),CB\$(15),N(16):TC =119:PMODE4

20 PMODE4: CLSØ: GOTO90

30 PRINT@481, STRING\$ (30, 128); PR INT@485, "HIT <ENTER> WHEN READY"

4Ø A\$=INKEY\$:IFA\$<>CHR\$(13)THEN4 ØELSECLS:RÉTURN

60 DATA32,32,32,32,32,32,63,65,9
9,85,73,65,65,65,65,97,81,73,69,
67,65,28,34,65,65,65,34,28,60,34,
34,60,32,32,32,28,34,34,34,42,3
6,26,60,34,34,60,40,36,34,28,34,
16,8,4,34,28,62,8,8,8,8,8,8,8,65,6
5,65,65,65,65,65,65,65,65,65,34,
20,8

80 DATAAACIOT, ABILTY, ABJOMO, ACDE MP, ACELRS, ADENVZ, AHMORS, BFIORX, D ENOSW, DKNOTU, EEFHIY, EGINTY, EGKLU Y, EHNIPS, ELPSTU, GILRUWY

90 FORF1=0T025:FORF2=0T012STEP2: READAZ(F1,F2):AZ(F1,F2+1)=AZ(F1, F2):NEXTF2,F1:FORF1=0T013:READAZ (16,F1):NEXT:FORF1=0T015:READCB\$ (F1):NEXT

100 SE\$="R2EU4HL2GD4BR12FR2EUHL2 HUER2NFBR5NR4D3NR3D3R4BR4R2EUBU2 UHL2GD4BR6RDLU":M1\$="BM103,162E2 D6NL2R2BR6U6F2E2D6BR4U6BR4ND6F4D 2U6BR4D5FR2EU5BR4R2ND6R2BR4NR4D3 NR3D3NR4": \$3\$="BM109,160R4D3NL3D 3NL4BR3XSE\$;": \$1\$="BM109,162E2D6 NL2R2BR3XSE\$;"

110 AP\$="BM88,137U4E2F2DNL4D3BR3;U6R2F2D2G2NL2BR5;U6R2F2D2G2NL2BR9NU6R4U6BR3;D3ND3R3EUHNL3BR7;D3ND3R3EUHNL3BR4D6R4U6L4BR7D6BR3U6F4D2U6BR3R2ND6R2BR6NFL2GDFR2FDGL2H"

120 CLS:PRINT@76, "BOGGEL":PRINT@
174, "BY":PRINT@233, "STEPHEN LAI
":PRINT@386, "DO YOU NEED INSTRUC
TIONS";:INPUTA\$:IFA\$="Y"THENGOSU
B500130 CLS:PRINT@66, "HOW MANY P
LAYERS (1-8)";:INPUTPL:IFPL<10RP
L>8THEN130ELSEDIMSC(PL), NA\$(PL),
FS(PL):FORF1=1TOPL:FS(F1)=F1:NEX
T

140 FORF1=1TOPL:CLS:PRINT:PRINT" WHAT IS YOUR NAME, PLAYER"F1 150 INPUTA\$:IFLEN(A\$)>9THENPRINT

"PLEASE, UNDER 10 LETTERS";:GOTO 150ELSENA\$(F1)=A\$:NEXT

160 CLS:PRINT@69, "DO YOU WANT TO PLAY BY"; PRINT@133, "(S) CORE OR (R) OUNDS"; INPUTC\$: IFC\$="R"THEN C=2:GOTO180ELSEIFC\$<>"S"THEN160 170 C=1:PRINT@225. "WHAT SCORE DO

170 C=1:PRINT@225, "WHAT SCORE DO YOU WISH TO PLAY UP

STOCK & FUND INVESTING

with the

TRS-80* COLOR COMPUTER

USE FUNDGRAF & FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL.

- GRAPHS fund's progress (up to 200 weeks).
- SUPERIMPOSES for comparison:
 - a line of constant percent growth.
 - a graph of any other fund (or stock).
- CALCULATES over any given time span:
 - the percent price change.
- the moving average (any span).
 INDICATES BUY and SELL signals.



- FUNDGRAF -

TAPE @ \$49.95

DISK @ \$69.95 - FUNDFILE -

DISK only @ \$27.95
• ADD \$2 Handling on

- all orders.

 Details? SEND SASE
- Details? SEND SASE
 16 K ECB Requir'd.
- 16 K ECB Requir'd printer optional

FUNDGRAF — A STOCK MARKET ANALYSIS PROGRAM FOR 16K EX TRS-80 COLOR COMPUTER

TRS-SU COLOR CONFORM THE TRANSPORT

FUNDFILE is a portfolio and account management program for securities. It creates files for up to 900 transactions & 50 securities and reports asset value, realized & unrealized capital gains, adjusted costs (for stock dividends), and MORE!!

PARSONS SOFTWARE, DEPT. A

118 WOODSHIRE DRIVE PARKERSBURG, WV 26101 18Ø PRINT@225, "HOW MANY ROUNDS D O YOU WISH TO PLAY"; :INPUTRO 19Ø CLSØ 2ØØ PCLS:FORF1=ØTO64STEP4:LINE(F 1,Ø)-(191+F1,192), PSET:LINE(F1,1 92)-(191+F1,Ø), PSET:NEXT:FORF1=6 8TO235STEP4:A=255-F1:A1=F1-64:LI NE(F1,Ø)-(256,A), PSET:LINE(A,Ø)-(Ø,A), PSET:LINE(Ø,A1)-(A,192), PS ET:LINE(256,A1)-(F1,192), PSET:NE XT 21Ø LINE(1ØØ,156)-(156,17Ø), PRES ET,BF:LINE(36,123)-(22Ø,144), PRE SET,BF:LINE(37,124)-(219,143), PS

TO";: INPUTHS: GOTO190

22Ø A=RND(-TIMER):LINE(65,9)-(18 4,109),PRESET,BF:L=16:FORF1=1T01 6:N(F1)=F1:NEXT:FORF1=1T016:A=RN D(L):T=N(A):N(A)=N(L):L=L-1:POKE 999+F1,T:NEXT:FORF1=1T016:N(F1)= PEEK(999+F1):NEXT

23Ø FORF1=ØTO3:FORF2=ØTO3:A=N(F1 *4+F2+1)-1:Q=ASC(MID\$(CB\$(A),RND (6),1))-65:FORF3=ØTO13:POKE2Ø25+ F1*768+F2*4+F3*32,AZ(Q,F3):NEXTF 3,F2,F1:LINE(38,125)-(218,143),P SET,BF:PLAY"T25L25BAGFEDCDEFGAB"

> GET THE MOST FUN AND WORK FROM YOUR COCO

GOLF: PLAY 18 HOLES AT ANYTIME 1 TO 4 PLAYERS GRAPHICS AND SOUND \$19.95 CASSETTE \$24.95 DISK

LOAN MYNDER:

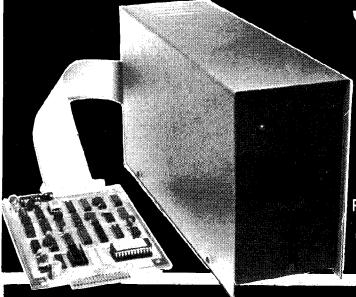
PRINT AMORTIZATION
\$19.95 CASSETTE
\$24.95 DISK

SEND FOR COMPLETE
PROGRAM LIST

ACCESS PROGRAM MARKETING, LTD.

PO BOX 23275 CHARLOTTE, NC 28212

:SCREEN1, Ø:TIMER=Ø 240 TI=INT(TIMER/60):IFTI>TC GOS **UB260** 25Ø TT=INT(TI/3Ø):T2=TI-TT*3Ø:LI NE(38+T2*6,125+TT*3)-(44+T2*6,12 7+TT*3), PRESET, BF: GOTO240 260 ONCH+1 GOTO270,280,290,300,3 10,320,330 270 DRAWM1\$:FORF1=1TO2:FORF2=0TO 1:SCREEN1,F2:PLAY"05T255L255BFA" :NEXTF2,F1:SCREEN1,Ø:CH=1:TC=124 280 DRAW"C0XM1\$;C5":CH=2:TC=149: RETURN 290 DRAWS3#:FORF1=1TO2:FORF2=0TO 1: SCREEN1, F2: PLAY "O3FCG": NEXTF2, F1:SCREEN1.Ø:CH=3:TC=154:RETURN 300 DRAW"C0XS3\$;C5":CH=4:TC=169: RETURN 310 DRAWS1\$:FORF1=1TO2:FORF2=0TO 1: SCREEN1, F2: PLAY "OZEDA": NEXTF2, F1:SCREEN1.Ø:CH=5:TC=172:RETURN 320 DRAW"C0XS1\$;C5":CH=6:TC=179: RETURN 33Ø SOUND1,20:CH=0:TC=119:DRAWAP \$:RP=RP+1 34Ø A\$=INKEY\$: IFA\$<>CHR\$(13) THEN 350 CLS:PRINT@75."ROUND #"RP::FO RF1=1TOPL:PRINT@160,NA\$(F1)",":P RINT"HOW MANY POINTS DID YOU GET ";: INPUTA: SC(F1) = SC(F1) + A: NEXT: 0 NC GOTO360,370 360 FORF1=1TOPL: IFSC(F1)=>HS THE N43ØELSENEXT: GOTO38Ø 37Ø IFRO=<RP THEN43Ø 38Ø A=1 390 CLS:FORF1=1024T01119:POKEF1. 128: NEXT: PRINT@10, "ROUND #"RP; :P RINT@65, "PLAYER"; : PRINT@9Ø, "SCOR E";:PRINT@96,STRING\$(32,"-"); 400 FORF1=A TOA+5: IFPL<F1 THEN42 ØELSEPRINT@64+(F1-A+1)*64,NA\$(F1)+STRING\$(26-LEN(NA\$(F1)),"-");: PRINT@92+(F1-A+1)*64,SC(F1);:NEX 41Ø IFPL>A+5 THENA=A+6:GOTO39Ø 420 GOSUB30:PRINT"THE CUBES ARE BEING SHUFFLED FOR THE N EXT ROUND":GOTO220 43Ø CLS7:PRINT@234, "FINAL SCORE" ::FORF1=1T03000:NEXT:IFPL=1THENC LS:PRINT@64,NA\$(1)",":PRINT"YOUR FINAL SCORE WAS"SC(1) "POINTS IN "RP"ROUNDS.":PRINT:PRINT:GOTO490 44Ø A=Ø 450 A=0:FCRF1=PL TO2STEP-1:IFSC(FS(F1))>SC(FS(F1-1))THENA=1:A1=F S(F1):FS(F1)=FS(F1-1):FS(F1-1)=A



ALTERNAT

DRIVE

USER STORAGE

80 TRACK DRIVE

ROM SOFTWARE

A Full Featured Basic Compatible DOS

INCLUDES: TG-99 Disk Controller W/CCMD 9 DOS ROM • 40 Or 80 Track Disk Drive • Power Supply • Case • 2 Drive Cable • 9 Disk Utility Programs • CCEDT9 Disk Text Editor • Disk Text Processor i

Manufactured Under License From Tall Grass Technologies

Editor/Assembler CO-RES9

CO-RES9 is a Co-resident Editor/Assembler that will allow you to create, edit and assemble machine language programs for the color computer. It will quickly and efficiently convert assembly language programs into machine code files, it will output machine object code to either cassette tape in a 'CLOADM' compatible format or directly to memory for direct execution. NOW

CO-RES9 editor/assembler tape

w/manual\$39.95 \$29.95

R.S. DISK EDITOR & ASSEMBLER DISK

"The Professional's Word Processor

TEXT PROCESSOR FEATURES

- Character Fill
- · Programmable Footer Right Justify Line
- **Multiple Footnotes**
- Three Indent Modes Three Programmable Headers
- Ten Programmable Tab Stops
- Margin Justification Left & Right Decimal Align, Center, Left &
- Right Justify on Tab Column Display & Input from Keyboard
- Change Formatting During **Processing**

- TEXT EDITOR FEATURES
- Single Keystroke Edit Command
- Append Files from Tape or Disk Fully Integrated Disk File Handler
- Edit or Process Files Larger Than Memory (No Conversion Required) Fully
- **ASC II Compatible Full Featured Line Oriented**
- Screen Editor
- · Search and Replace Any **Character Pattern** Copy, Move or Delete Lines
- or Blocks of Text Edit Basic, Text or Assembler Files

TEXT PRO II Features Over 70 Commands In All. Disk ... \$7

- Full Text Buffering
- Terminal Baud Rates 300 To 9600 Baud
- Automatic Word Wrap Eliminates Split Words
- Full/Half Duplex
- Automatic File Capture
- Programmable Word Length, Parity & Stop Bits
- Automatic Buffer Size At Memory Limit
- Save & Load Text Buffer To Tape Or Disk
- Send Files Directly From Buffer Or Disk
- Full Disk Support For Disk Version
- Printer Baud Rates 110-4800
- Send Control Codes From Keyboard
- ASCII Compatible File Format



 Display On Screen Or Output Contents Of Buffer To Printer

We also have a disk version available called "DISKPACK." It includes all the commands mentioned plus commands for disk control. They include: Disk Load, Disk Save, Directory, Send Disk File and Kill Disk File. As usual all files are Basic Compatible ASCII formatted files which are also compatible with our Text Editor and Word Processor programs.

Datapack on tape w/manual \$24.95 Diskpack for R.S. disk w/manual \$49.95 Diskpack for CCMD 9 w/manual \$39.95

5566 Ricochet Avenue Las Vegas, Nevada 89110



All Orders Shipped From Stock Add \$2.50 Postage

460 NEXT: IFA=1THEN450 47Ø A=1

LSEEND

480 CLS:PRINT" PLAYER"; : PRINT® 26, "SCORE": PRINT@32, STRING\$ (32." -"):FORF1=A TOA+5:IFPL<F1 THENGO SUB30: GOTO490ELSEPRINT@(F1-A+1)* 64, NA\$ (FS (F1)): PRINT@26+(F1-A+1) *64, SC(FS(F1)): NEXT: GOSUB30 490 IFPL>A+5THENA=A+6:GOTO480ELS EPRINT"DO YOU WANT TO PLAY AGAIN (Y/N)":INPUTA\$:IFA\$="Y"THENRUNE

500 CLS:PRINT@73, "INSTRUCTIONS": PRINT: PRINT" EACH PLAYER WILL N EED A PAPER AND PENCIL.":PRINT:P THE OBJECT OF THIS GAME I S TO LIST AS MANY WORDS AS POSSI BLE WITHIN A GIVEN TIME LIMIT. WHEN A WORD A FOUND, IT IS WRITT EN DOWN."

510 GOSUB30 520 PRINT: PRINT" WHEN THE TIMER STARTS, EACH PLAYER SEARCHES FOR WORDS OF THREE LETTERS OR MORE. THE TIME LIMIT FOR FINDIN G AS MANY WORDS AS POSSIBLE IS T HREE MINUTES. SIGNALS ARE SOUN DED AND FLASHED WHEN ONE MINUTE, 3Ø SECONDS, AND";

Introducing - MORE Quality Software by MSI.

Featuring * COLOR FINANCE for the Color Computer - 32k Ext. Disk reg'd. \$59.95

Features include:



- User Friendly No programming knowledge
- Fully documented/Easy to use
- Maintain up to 21 Asset, 21 Liability, and 54 Expense Accounts
- Print Options (Account Statements, Budgets, Trial Balance, & MORE!)
- Backup/Restore To Cassette Tape
- Large 42 x 32 screen display
- Sample Session Included for Fast and Easy Instruction.



ONLY \$59.95 exclusively from Delker Electronics, Inc.

(Dealer Inquiries welcome) Delker Electronics. Inc. P.O. Box 897 Dept D Smyrna, TN 37167 800-251-5008 615-459-2636 (Tennessee) TN 800-545-2502

53Ø PRINT"1Ø SECONDS ARE LEFT.": PRINT: PRINT" THE 'Q' IS FOLLOWE D BY A 'U' FOR THE REASON THAT 'Q' IS AL-WAYS FOLLOWED BY A ' U' IN THE ENGLISH LANGUAGE. 'Q U' COUNTS ASTWO SEPERATE LETTERS ."::GOSUB3Ø

540 PRINT:PRINT" WORDS ARE FORM ED BY LINKING ADJACENT LETTERS TOGETHER. LET- TERS MUST JOIN I N PROPER SE-QUENCE TO SPELL A WORD. THEY MAYJOIN HORIZONTALL Y, VERTICALLY, OR HORIZONTALLY.

550 PRINT:PRINT" NO SINGLE LETT ER MAY BE USED MORE THAN ONCE A WORD, BUT IF THERE ARE TWO LE TTERS OF THE SAME TYPE IN DIF FERENT POSITIONSOF THE GRID. BOT H MAY BE USED. ": GOSUB3Ø 560 PRINT:PRINT" ANY WORD, WITH THE EXCEPTION OF PROPER NOUNS. IS ACCEPTABLE, AS LONG AS IT CA N BE FOUND IN A STANDARD ENGLISH DICTIONARY.":PRINT:PRINT" AL AND SINGULAR NOUNS CAN BE WRI TTEN DOWN AS SEPERATE WORDS. AND BOTH WILL RECIEVE 570 PRINT"FULL CREDIT.":GOSUB30 580 PRINT: PRINT" WHEN THE TIMER

ANY LIST THAT " = 590 PRINT"CONTAINS THAT WORD. ":G OSUB3Ø

STOPS, EVERYONESTOPS SEARCHING FOR WORDS. ONE AT A TIME, EACH

IF ONE OR MORE OTHER PEOPLE CON

TAIN THAT EXACT WORD ON THEIR LI ST. THE WORD IS CROSSED OUT FROM

PLAYER READS HIS LIST OF WORDS.

600 PRINT: PRINT" THE COMPUTER W ILL SIGNAL YOU TO 'ADD UP POINT S' . THE SCORING GOES AS FOLLOWS : ": PRINT@161, "WORD LENGTH": PRINT @192," 3 4 5 6 7 8 OR MORE ":PRINT@257, "POINTS":PRINT@288," 2 3 5 11"

610 PRINT:PRINT" ONLY COUNT WOR DS ON YOUR LIST THAT HAVEN'T BEE N CROSSED OFF. AFTER YOU ADD UP YOUR POINTS FORTHE ROUND, PRESS <ENTER>":GOSUB3Ø

620 PRINT:PRINT" A GAME IS WON AFTER A PLAYER HAS EITHER EQUAL LED OR TOPPED A CHOSEN HIGH SCOR E OR BY THE PER-SON WITH THE HIG HEST SCORE AFTERA CHOSEN NUBER O F ROUNDS. ":PRINT:PRINT@224, "------END-OF-INSTRUCTIONS----"; 63Ø GOSUB3Ø: RETURN



by PAL Creations

You are the new keeper of an old lighthouse. The fact you have no experience doesn't matter as the old keeper will meet you there to show you the ropes. 32K EXT.....\$14.95

MANSION OF DOOM

by PAL Creations

Rescue the Princess Marlena from the mysterious Count Von Steinoff and reunite her with the townspeople of her village in Transylvania. The Count's mansion has 76 distinct locations for you to explore in your rescue attempt. 32K EXT.....\$14.95

STALAG & ENO

by PAL Creations

- 1) You are an allied POW in a German prison camp in 1944 and were forgotten in the hot box when the camp was evacuated due to unexpected bombing raids. How will you get out ALIVE?
- 2) Your eccentric old aunt just died and left you a fortune in cash. To prove you deserve it, you must decipher the clues and find your fortune, which she hid in her living room.

32K EXT Both for \$14.95



OLDIES BUT GOODIES...

RAINBOW JUNGLE TREK

Lost in a jungle with wild animals lurking; your only survival is to find a safe compound before you are lunch for lions; high resolution; multi-color. 16K EXT.....\$14.95

SCORE-EZ

From 1 to 6 people can play this excellent adaptation of a popular board game. The computer keeps score for all players, and rolls dice. You can roll again just like the original game. Properly position the results of each turn for maximum score. The only thing you will need besides your computer is players. Color graphics and sound will entertain you for hours, and it's EZ to play. 16K EXT.....\$15.95



BIORHYTHM PSYCHIC APT.

- 1) Prints biorhythm charts of nearly unlimited length; attractively formatted for use on Line Printer VII.
- 2) Your psychic ability is determined through questions evaluating your psychic experiences 16K Ext Both for \$15.95



by PAL Creations

You have just escaped from a German prison camp. That was the easy part. Now you must get out of Germany! 32K EXT.....\$19.95

TOWER CASTLE

from Moreton Bay

BLACK SANCTUM

by Mark Data

EL DIABLERO

by Computerware

.....\$19.95

CALIXTO ISLAND

by Mark Data

National City, CA 92050

Dealer/Author Inquiries Invited

All programs warrantied 60 days from date of purchase to original purchaser. Unless otherwise specified, shipping and handling \$2.00 per order. California residents add 6% sales tax.

U.S FUNDS ONLY C.O.D. ORDERS ACCEPTED NO CREDIT CARD ORDERS



CARIBBEAN ODYSSEY

You are stranded on a Caribbean island once used by pirates to store their treasures. While searching over 70 distinct locations, can you find your one chance for rescue?

32K EXT.....\$19.95



THE FINAL COUNTDOWN

RAINBOW COUNTDOWN by Bill & Debbie Cook
You are outside a missile base which has just been evacuated because a beserk General has started the countdown on a nuclear missile - target: MOSCOW. Your mission, if you accept it, is to stop the missile launch and prevent WWIII. 16K EXT.....\$14.95

S.S. POSEIDON

by Bill & Debbie Cook

You are aboard the S.S. Poseidon when it is capsized by a tidal wave. It is floating bottom-up on the surface and taking on water. Will you survive to tell your tale? 16K EXt\$14.95

SANDS OF EGYPT

UTILITIES

Disk to Tape (Tom Mix)	19.99
Tape to Disk (Tom Mix)	19.95
Color Diagnostic (Computerware)	. 17.95
Programmers Toolkit (Moreton Bay)	
GNT (Graphics 'n Text)	

ARCADE ACTION!!!

From Computerware:	Pac Attack II, Doodle Bug, Shark Treasure	24.0	95
	Megapede, Rail Runner		95
	Synther 7 Music Synthesizer		95
From Intracolor:	Colorpede		
From Tom Mix:	The King, Katerpiller	24 9	95
	Protectors, Moonlander		95
	Bird Attack)5
	Bird Attack		95
From Spectral Associates:	Galax Attax	21.0	06
	Planet Invasion	21.9	15
	Ghost Gobbler	24.9	15
	G11051 G000161		13

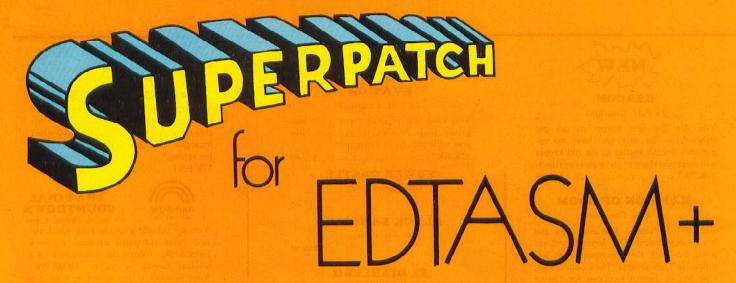
FOR SERIOUS APPLICATIONS:

refewriter - 04 (Cognitec)	. 59.95 Disk.
Mailing List (Tom Mix)	- 19.95 Disk
Coco Writer (Moreton Bay)	. 34.95
File Cabinet (Moreton Bay)	. 29.95
Report (Moreton Bay)	24.95



Excellent Royalties

ALL SUBMISSIONS EVALUATED Send S.A.S.E.



By Roger Schrag

Roger Schrag updates his popular Patch to disk for Radio Shack's Editor Assembler Program.

n the December issue of the Rainbow, I presented a program that would patch Radio Shack's EDTASM+ cartridge to store programs on disk instead of on tape. Since then I have added a whole host of new features to my patch program. Now I would like to present Super Patch, an entirely new patch program. It is shown in Listing 1.

What does Super Patch do, you ask? Lots of things. It patches the Editor so that you may load or write source code to disk. It also allows you to assemble your programs directly onto disk, as well as verify any disk file.

Super Patch modifies ZBUG so that you may load a block of memory from disk, either normally or offset. It also allows you to write any block of memory to disk, as well as display a file directory of any drive on the screen or the printer.

Super Patch also provides many minor features and conveniences, namely a repeating keyboard, custom cursor and automatic selection of the default disk drive and printer baud rate.

To add all these features to EDTASM+, we must make it reside in low memory. Transferring it from ROM to RAM allows us to alter sections of code, and to insert whole new routines. Unfortunately, moving EDTASM+ to RAM eats up a lot of our memory that could otherwise be used for program storage. On a normal 32K Color Computer you will only have about 17K of storage space for your source code.

However, this brings us up to Super Patch's most powerful feature. It supports 64K! If you have installed the 64K modification in your computer, or if you purchased your

(Roger Schrag, a high school senior, enjoys working with the CoCo and writing for the Rainbow. He also designs and translates programs for Adventure International.)

machine after approximately October, 1982, Super Patch will automatically use all of your system's memory, giving you about 49K of space for your programs. But don't fret if your computer doesn't have the 64K ability—Super Patch will still work fine.

Here's how to use Super Patch to create your enhanced version of EDTASM+: First, insert your EDTASM+ cartridge and turn on your computer. When the sign-on message appears, go into ZBUG and enter U C000 1000 27FF. This will copy EDTASM+ into low memory, where the final patched program will reside. Dump a copy of it onto tape by entering P EDTASM 1000 37FF 1000.

Next, return to the Editor and enter the source code shown in Listing 1. Notice the section labeled Program Customization. There are several decisions you will have to make based on your own personal preferences and the equipment you have. Let's look them over:

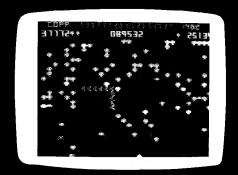
Your first option is the cursor format. The program as it appears in the listing will give you a red blinking cursor. However, the comment lines show three other types of cursor you may use. Let's suppose that you would rather have a solid black cursor than a blinking red one. You would insert asterisks to make lines 20 and 21 into comment lines, and remove the asterisks from lines 26 and 27.

The next option is the default drive. Any time you are asked for a filename and you don't specify a drive number, the default drive will be used. Since I only have one drive, zero must be my default. However, if you have two drives, you might find it more convenient to have drive one as the default.

The next option is the status of the verification system. As listed, the program will verify every sector that is ever written on the diskette. This is a good precautionary measure, but it slows down write operations by about 50 percent. The choice between speed and safety is all yours. This won't

Setting The Standards

WHAT THEY ARE SAYING ABOUT COLORPEDE

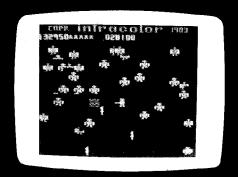


COLORPEDE

This truly outstanding engineer designed, 100% machine language game with multi-colored high resolution characters and fast action will challenge the most avid arcade buff. Can be played by 1 or 2 players controlled with joy sticks or key board. Joy stick control is fast, smooth and accurate. As COLORPEDE slithers through the toad stools, you attempt to destroy the COLORPEDE, knock out the menacing Bouncing Bug and eliminate toad stools while accumulating higher and higher scores. Demonstration mode with top 5 scores. Pause feature. For 16K Color Computer and TDP-100.

Cassette-\$29.95

Disk-\$34.95



ROBOTTACK

.Ultra fast arcade action with colorful high resolution graphics. You are the super human who must fight off the attacking robots and save the remaining humans from destruction. You have super powers, can shoot in any direction and move anywhere on the screen to accomplish your vital mission.

Engineer designed, 100% machine language. Can be played by 1 or 2 players with joy stick control. Top 5 scores displayed. Pause feature. For 16K Color Computer and TDP-100 with joy sticks.

Cassette-\$24.95

Disk-\$27.95

TO ORDER:



VISA, MASTERCARD, Money Order. Please allow 2 weeks for checks. Add \$1.50 for shipping, \$3.00 outside U.S. 4% tax in Mich.

intracolor

P.O. Box 1035, East Lansing, MI 48823 (517) 351-8537

COMMUNICATIONS

affect the speed of read operations, such as loading source code.

The next option is the printer's Baud rate. If you have a Radio Shack printer, you will probably want to select 600 Baud. But if you have a printer that doesn't operate at the standard 600 Baud, you may use this option so that you won't have to *POKE* the Baud rate constant each time you want to use your printer.

The remaining options relate to the repeating keyboard. You may want to try various combinations for RATE1 and RATE2 until you find what is most comfortable for you. Some people may not want certain keys to repeat, so the final option allows you to keep the ENTER, BREAK, and CLEAR keys from repeating.

After you have selected all of your options, enter the rest of the source code shown in Listing 1 exactly as it appears. Assemble it onto tape directly after the copy of EDTASM+you made from ZBUG. Save the source code right after that. You may want to look it over or modify it at some future time.

Now you are ready to put everything on disk, so you will need to connect your disk controller. Please turn off your computer when you remove the cartridge and insert the controller. You should always play it safe and shut off the computer when you exchange cartridges.

Rewind your cassette tape all the way and turn on the computer. When the Disk BASIC sign-on message appears, enter *CLOADM* to load the RAM version of EDTASM+saved from ZBUG, but don't execute it yet. When OK appears, type *CLOADM* again to load in the assembled patch program. Don't execute it, either. The patch program



GRAND SLAM BRIDGE



SHARPEN UP YOUR BRIDGE GAME. COM-PUTER BIDS YOUR PARTNER'S HAND AND PLAYS THE OPPONENT'S HANDS. RAN-DOM HANDS DEALT EACH TIME. CARDS, TRICKS, BIDS, AND CONTRACT SHOWN ON SCREEN.

32K

CASSETTE \$19.95



STOCK OPTION STRATEGIES

DEVISE YOUR OWN STOCK OPTION STRATEGIES. COVERED OPTIONS, STRADDLES, CALLS, AND PUTS. % GAINS AND LOSSES VS. FUTURE STOCK PRICES GRAPHED IN COLOR, EASY TO USE, NO DATA BASE REQUIRED, JUST ENTER FROM KEYBOARD. MENU DRIVEN.

16K

CASSETTE \$14.95



SEND CHECK OR MONEY ORDER TO:



GREENTREE SOFTWARE P.O. BOX 97 GREENWOOD, IN 46142



will overwrite various sections of EDTASM+ as it loads, and a block of new code will be added on.

When OK reappears, you are ready to save the final product onto disk by entering SAVEM"EDTASM", &HE00,&H37FF,&HE00. Save as many copies on different diskettes as you like.

Now enter the program in Listing 2 from Disk BASIC and save it on your diskettes right along with EDTASM+. This is a utility to transfer source code files from tape to diskette. You will probably want to transfer the source code from Listing 1 right away, before you forget which tape you put it on.

Your Super Patched EDTASM+ is now ready to use. Simply type LOADM"EDTASM": EXEC and press ENTER to load it. It will reside in memory from \$E00 to \$37FF, and use memory from \$3800 to \$39FF for internal use. All memory from \$3A00 on up to \$7FFF, or \$FEFF on a computer with the 64K capability, will be available for your program storage.

Super Patched EDTASM+ is completely position independent, so you may load it offset. For example, the command LOADM"EDTASM",&H1000:EXEC will load EDTASM+ into memory from \$1E00 to \$47FF, and memory from \$E00 to \$1DFF will be left untouched. You could use this memory for graphics pages, assembling directly into memory, or whatever you wish.

The L, W, V, and A commands of the Editor have all been modified. To load source code from diskette, press L and ENTER. You will be prompted to enter the filename. Any filename valid in BASIC is valid here, but don't enclose it in quotes. Also, if you don't include an extension, none will be used. An extension isn't mandatory, but I would recommend that you use the extension / SRC for all source code files you create.

Finally, if you don't specify a drive number, the default drive will be used. Once you enter the filename, the source code will be loaded.

The W and V commands work in much the same way. All the V command does is merely open the file and immediately close it. This verifies that a file does indeed exist, and that there aren't any serious problems in the diskette's directory.

To assemble a program, type A and any assembly switches you would like to use. Then press *ENTER*. Unless you specify the IM or NO switches, you will be prompted for the filename. You should give any program you assemble the extension /BIN, but, as always, no extension will be assumed if you don't specify one.

As lines of assembled code scroll across the screen, the computer will pause every now and then to write a sector to the diskette. You may press *BREAK* to abort the assembly, but you will have to wait a few seconds for the computer to first close the disk file.

A word of caution is in order. *Never* press the Reset button while the red light on any of your drives is on. If you were to press Reset while the computer was writing a sector on the diskette, you would probably have to reinitialize the entire diskette with *DSKINI*. This applies to all situations, not just when using EDTASM+.

The L, P, and V commands of ZBUG have also been modified. About the last one, the V command, a word is in order. The unpatched version of EDTASM+ on cartridge has a V command in the Editor and a V command in ZBUG. Both do the exact same thing: verify a tape file. As we have already discussed, the Editor's V command has been patched to verify a disk file. ZBUG's V command, however,

Complete Personal Accountant: made more frien

If you have any doubts that we offer the best and most complete personal financial package available, look over the features listed below. Now we have the only package with **full screen editing** for Atari 400/800,* TRS-80 COLOR, Commodore 64* and VIC-20; the ability to move the cursor in any direction makes our accountant-designed package even more friendly than before. No one else

offers all of these:

1. CHECKBOOK MAINTENANCEautomatically balances your checkbook with each entry; manages checks, charges, deposits, and interest quickly and accurately.

2. CHART OF ACCOUNTSmaximum of user flexibilty with up to 99 accounts plus 9 subcategories may be defined.

3. CHECK SEARCH—mul-

ti-reference; tracks items on every field including tax deductibles.

4. NET WORTH/
INCOME/EXPENSE
STATEMENT—

know-exactlywhere-you-stand program generates statements with the

touch of a key.
5. DETAIL & SUMMARY
BUDGET ANALYSIS—an absolute necessity in financial planning. 6. CHECK WRITER—prints

personalized checks.**

*Random Access available for disk.

**ATARI 400/800, COMMODORE 64, TRS-80 COLOR

7. PAYMENTS/APPOINTMENTS CALENDAR -monthly displays of up to 250 bills and 200 appointments.

8. COLOR GRAPH DESIGN PACKAGE—graphs

all monthly files.
9. MAILING LIST—maintains all records, sorts by name or zip, allows add/change/delete. 10. FRIENDLY USER MANUAL—complete

with indexing, flow charts and diagrams; the most thorough documentation on the market.

This all adds up to the finest personal financial system available — comprehensive enough for a small business.

Less than one hour of data input per month will allow this menudriven package to help you handle your finances with a lot more fun than drudgery.

Plus, ours is the only expandable system; purchase the package in sections and add on as your financial needs grow. Features 1, 2, 3 and 6: \$39.95 diskette, \$36.95 cassette; Features 4 and 5: \$29.95 diskette, \$26.95 cassette;

Fairliner & Joseph Features 7, 8 and 9: \$29.95 diskette, \$26.95 cassette; or save \$19.90 or \$15.90 respectively by buying the entire system for \$79.95 diskette, \$74.95 cassette.

PRINTSALLSTATEMENTS

Prices subject to change without notice. See your local dealer or order direct. New catalog available.

Add \$3.00 for postage and handling. Credit card orders call toll free:

DEALER INQUIRIES INVITED

a division of FUTUREHOUSE, INC.

p.o. box 3470, dept. R, chapel hill, north carolina 27514, 919-967-0861

has been transformed into a whole new command for displaying file directories. More on that later.

To load a machine language program or block of memory from ZBUG, press L and ENTER. You will be asked for the filename and the program will be loaded. You may specify an offset directly after the L, if you wish. For example, L 100 will load the program offset by \$100, or 256 bytes.

To put a block of memory onto diskette, press P followed by the starting address, the ending address, and the execution address. You will be asked for the filename and the block of memory will be written. This command may be used to duplicate programs (no pirating please), save blocks of data, and so forth. As an example, the command P 5000 6000 5200 will write everything in memory from \$5000 through \$6000 onto diskette. The program will begin execution at \$5200.

The F command will display a directory of all files on a particular diskette. To display the directory on the screen, type in FS and number of the drive containing the diskette. To print up the directory on your printer, type in FP and the drive number. In either case, you may leave out the drive number and the default will be used.

You may press "shift @" to freeze the display just as you can with the DIR statement in BASIC, but don't press BREAK! Doing so will return you to BASIC. If you forget and do press BASIC, press Reset to reenter ZBUG.

From ZBUG, you are not able to examine the BASIC and disk system ROM's. Instead, you are able to examine the upper block of 32K RAM that usually isn't accessable from BASIC. If your computer doesn't have the 64K capability,

>>>--->ATTENTION 6809 HACKERS<----< QIWE NOW HAVE 2 CONVENIENT LOCATIONS!!

1) COLOR-80 BBS V4.0: A DELUXE BBS WITH THESE FEATURES; AUTO 300 OR 1200 BAUD, JPLOPOING, DOUBLORDING, INKEYS, PICTURES, 25 TISC QUEUE, NATLING LIST GENERATION, PLUS HORSE. CAN BE CUSTORIZED. WRITTEN IN ASSERBLY & BASIL. REWWIRES OWN COLOR, SUSHER DISK UTILITY: JERY LISER FRIENDLY ASSERBLY LANGUAGE WITLITY HAT TOKES 12 SUIPER DISK UTILITY: JERY LISER FRIENDLY ASSERBLY LANGUAGE WITLITY THAT TOKES 13 COP-DUPP: ALLOWS ONE TO DUPP THEIR HI-RES COLOR SCREEN TO A COP-115 PRINTER IN UP TO 4 COLORS IN NAY PYDUES; WITTEN IN ASSERBLANG. DSK OR CASS. 425.00 AT HONITOR ORIVER: EMBLES ONE TO USE A MONITOR. NO MORE RE INTERFERENCE. USES CRISP PICTURES. HAS OUTPUTS FOR COLOR, INDOMEMORE, AND AUDIO. REQUIRES NO SOLORING. EASY TO INSTALL. ALLOHS BOTH COLOR/MONGCHAPIE, AND AUDIO TO BE 430.00 COLORING. EASY TO INSTALL. ALLOHS BOTH COLOR/MONGCHAPIE AND AUDIO TO BE 450.00 COLOROPY: THE BEST SIRRET COMMUNICATION PROGRAM AVAILABLE—MUCH BETTER THAN YOUND! PRODORNES LIKE VIDEOTEX. FEATURES ABILITIES TO DOWNLOAD, JPLOAD, PRINT BUFFER, SCROLL BUFFER, 18 TO 1200 BROUD, TOWNLOFF PROTOCOL, RECEIVE LO-RES GRAPHICS, SAVE BUFFER AND HORE. AVAILABLE ON ETHER ROMPACK OR DISK. 499.95 BRIDGET FERTINAL DRIVER 3.0. ALLOWS ONE TO DEFERTE HIS COCO FROM ANOTHER COPPUTER/TERMINAL UND SARON DRIVE FOR OPPLETE CATALOO—

"FRANCE FERTINAL UND SARON DRIVER 3.0. ALLOWS ONE TO DEFERTE HIS COCO FROM ANOTHER COPPUTER/TERMINAL UND SAR BAUD MODER. THAT SOURCES, CARLES, CHIPS, PERFORM

16 ALSO SELL COLLING FANS, DUST COURRES, DISK DRIVES, CARLES, CHIPS, PERFORM. 1) COLOR-88 BBS 04.8% A DELUXE BBS WITH THESE FEATURES; AUTO 388 OR 1288 BAUD,

HE ALSO SELL COOLING FAMS, DUST COVERS, DISK DRIVES, CABLES, CHIPS, PERFORM UPORADES + PORE. WE'RE DEALERS FOR EIGEN STSTERS, Jun, SPECTRUM PROJECTS, JUN, & DTHERS. DEALERS INQUIRIES INVITED. PLEASE ADD #2 FOR SHIPPING. C.O.D. EXTRA



(EAST COAST) LOGICAL COMPUTER PRODUCTS P.O. BOX 125-5121 ARLINGTON MA 02174 BBS/MODEM-(617) 646-6809



(WEST COAST) SILICON RAINBOW PRODUCTS 1111 W. EL CAMINO REAL SUITE 109 SUNNYVALE, CA 94087 BBS/MODEN-(408) 733-6809

looking at this upper block of memory may give strange

We've now covered just about all of the features provided by Super Patch. To summarize, only the L, W, V, and A commands of the Editor, and the L, P, and F commands of ZBUG have been modified. Everything else should operate as it always has, except for the new cursor and repeating keyboard.

Now I have a puzzler question for you. If you look at addresses \$E25C through \$E269 of the unpatched EDTASM+ cartridge, here is what you will find:

LEAX 0BE33,PCR LDA I8E X, STA LDU **18F** STU I,X

This routine is executed by ZBUG just before printing the BRK @ message whenever a breakpoint is encountered. Does anyone have any ideas as to why Microsoft would make ZBUG attempt to write to the Color BASIC ROM?

This article represents the start of a new series of articles about somewhat more advanced applications of assembly language. If you have any topic suggestions, or if you have any questions about Super Patch, feel free to drop me a line. My address appears at the top of the first listing. Please include a self addressed, stamped envelope, and I will respond as promptly as possible.

Listing 1:

```
99991 ***************
00002 * SUPER PATCHED EDTASM+
00003 *****************
80004 *
00005 *By: Roger Schrag
00005 *
          2054 Manning Avenue
00007 *
          Los Angeles, CA 90025
00008 *
99999 *Final revision: 5/05/83
00010 *
00011 *** Program Customization ***
00012 *For each option, alternatives are
00013 *shown below in comment lines. Feel
90014 *free to substitute these (or your
90015 *own) alternatives according to your
00016 *personal preferences
00017 *
00018 *
00019 *Cursor format
00020 CURSOR EQU
                      $60
                              Red cursor
00021 BLINK
             EQU
                      $9F
                              Blinking
00022 *CURSOR EQU
                      SFF
                              Red cursor
00023 *BLINK EQU
                      $00
                              Non blinking
00024 *CURSOR EQU
                      $60
                              Black cursor
00025 *BLINK EQU
                      $20
                              Blinking
00026 *CURSOR EQU
                      $80
                              Black cursor
00027 *BLINK EQU
                      $00
                              Non blinking
00028 *
```

DO YOU HAVE CONTROL? THEN TAKE COMMAND WITH WICO!





COMMAND CONTROL ADAPTOR

Use one or two joysticks. WICO Adaptor need for all Joysticks \$17.95

WICO **FAMOUS RED BALL**

Instant-action dual fire buttons. Pinpoint accuracy.

0

G

R

4

*34.95

WICO JOYSTICK 15-9714

Unmatched accuracy, sensitivity and durability, \$29.95

WICO TRACK

360° movement, the ultimate in Arcade Play

FROM "SHELL" **DEATH STAR**

Use the force and save the princess (Review in April's Rainbow)

> 32K/EXT \$19.95

BATTLE STATIONS 16K/FXT

A two computer strategy game. Two players trade shots from computer to computer. Also single player mode No hardware modifications.

\$21.95

TWIXT 16K/EXT

Build a fence between your boarders while blocking your opponents attempts to do the same.

*18.95

FERERATION BOOT CAMP 16K/EXT

You've been drafted for 16 wks. Four games in one can you hack it?

FROM ADVENTURE INTERNATIONAL

FIRE COPTER

It's your job to stop the arsonist and put out the fires before the city burns down. 3-dimentional

16K/ML

\$24.95



SEA DRAGON

32K/ML *34.95

Pilot your submarine against all sorts of dangers and destroy the reactor in the underwater cave.



Т

Н

E

0

*18.95

FROM

THE KING 32K/ML

TOM

4 full screens. Just like arcade



\$24.95



BALL

*65.95

SONAR SEARCH 16K/EXT

Using sonar and depth charges find and destroy enemy ships.

\$18.95

EXTERMINATOR

16K/EXT With your can of "RAID"

you fight back the insect attack.

\$18.95

TRAP FALL

16K/ML

The "pit falls" in this game are many. Hidden Treasures great graphics

\$27.95



QUICK SHOT

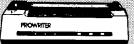
Deluxe Joystick Controller. Rubber Suction Cup Footing.

*19.95 ea./ ^{\$}34.95 pr.

GRAB 'N CHASE 16K/EXT

An armored car has lost its cargo. Who will find it first? The cops or Robbers? \$18.95

\$ \$ NOW ON SALE \$ \$



Pro/Writer Printer-8510 A HIST SALE

495.00 439.95

65.95

Package 1499.95

VISA/MC add 5% Ship/handling & insurance add \$10.00



SUPER JOYSTICK

Controller Retractable Cable. Two FIRE Buttons

*19.95 ea./ \$34.95 pr.

STAR RAID 16K/EXT

Dock with your base station to fuel up and fight the attacking aliens.

\$18.95 ATARI

FROM DATA SOFT

ZAXXON

32K/ML The official arcade version.

\$39.95

Interface

SPACE SHUTTLE

Full instrumentation! Actual simulation of space flight.

\$28.95



POINT MASTER

Fast and Rugged for those who Game Seriously. *17.95 ea./ *32.95 pr.

TRIGA COMMAND

Adult Size Joystick with Real Conquering Power.

*19.95 ea./

*9.50 Each 2/*18.00 COMMODORE 14.95 Fach 2/124.95

SNOOPY & THE **RED BARRON**

16K/EXT

A hi-res graphic "Dog" fight. Recommended for kids.

MOON SHUTTLE

16K/ML A super high action arcade game. A MUST.

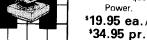
\$28.95

32K/EXT

GRABBER 32K/ML

Your job is to grab the 8 treasures and store them in the center boxes. Outstanding sound. Super high res graphics

\$27.95



10% DISCOUNT Mention this ad

FREE 16K Adventure with \$50,00 order.

New from WICO THE BOSS! Newly Engineered Custom Grip Awesome Performance

\$24.95



FROG 16K/ML

A realistic rendition of the arcade classic! Lots of action.

\$27.95

IF IT'S NOT GOOD, WE DON'T SELL IT DEALER INQUIRIES WELCOME

S & S ARCADE SUPPLIES 8301 Sarnow Dr./Orlando, FL 32807 9 to 5 EST (305) 894-1887 - Evenings (305) 275-8490

USA Orders under \$50 - Add \$2.50 OTHER Orders Add \$5.00 ship/hnd. Fla. Residents add 5% sales tax. Visa/MC Add 5%

NO C.O.D. ORDERS

99929	*			
99939	*Which d	rive is	the defa	ult drive
00031	DEFALT	EQU	\$9	Drive zero
99932	*DEFALT	EQU	\$1	Drive one
00033	*			
ØØØ34	*			
<i>0</i> 0035	*Whether	or not	all writ	e operations
00036	*should	automati	ically be	e verified
99937	VERIF	EQU	\$FF	Verify everything
00038	*VERIF	EBN	\$99	Don't verify
00039	*			
99949	*			
99941	*Printer	's baud	rate	
00042	BAUD	EQU	\$1	9600 baud
00043	*BAUD	EÐU	\$57	600 baud
00044	*BAUD	EQU	\$BE	300 baud
00045	*			
00046	*			
				down a key
			ts repeat	
99949	RATEI	EQU .	\$1E	Half a second
00050	*RATE1	EQU	\$ØF	Quarter of a second
00051	*RATE1	EQU	\$3C	One whole second
00052	* .			
00053	*			
00054	*Rate at	which t	the keys	repeat
99955	RATE2	EQU	\$03	Medium
00056	*RATE2	EQU	\$∅2	Fast
00057	*RATE2	EΩU	\$96	Slow



```
99958 *
00059 *
00060 *Which keys have the repeating feature
00061 REPRES EQU
                       $7F
                               Every key repeats
90062 *REPRES EQU
                       $3F
                               Every key repeats
00063 *
              EXCEPT: Enter, Clear, and Break
00064 +
99965 *
99966 *Change the sign-on message
00067
              ORG
                       $1056
99968
              FCC
                       /SUPER PATCHED EDTASM+ 1.0/
00069
              FCB
                       $ØD
                               Carraige return
99979
              FCC
                       /(C) BY MICROSOFT/
99971
              FCB
                       $AØ
                               Terminator
00072 *
00073 *
99974 *Fix an apparent bug in Ibug
00075
              ORG
                       $2D4E
90976
              LEAX
                       $326A,PCR Load SWI vector
99977 *
99978 *
90079 *Change the filename handling system to
00080 *allow the user to enter full disk file
00081 *names (in the FILENAME/EXT:D format)
00082
              ORG
                       $15EØ
99983
              LBRA
                      FNAME
00084 *
00085 *
00086 *Change references to device #-1 (tape)
00087 *to device #1 (disk)
00088
              ORG
                      $1547
00089
              LDB
                       #1
99999
              ORG
                      $1574
00091
              LDB
                       #1
00092
              ORG
                      $15AD
00093
              LDA
                       #1
00094
              ORG
                      $15CD
00095
              LDA
                       #1
99996 *
00097 *
00098 *Make the Editor close the disk file
00099 *when access to it is complete
99199
              ORG
                      $1852
00101
              LBSR
                      ECLOSE
00102 *
00103 *
00104 *Make Ibug close the disk file
00105 *when access to it is complete
99196
              ORG
                      $2088
88187
              LBSR
                      ZCLOSE
00108 *
00109 *
00110 *At the right time, call a routine
90111 *to open the disk file, instead of
00112 *a routine to open the tape file
00113
              ORG
                      $1587
                               Patches into
99114
              LEAU
                      ASSEM, PCR
00115
              BRA
                      $15D7
                               the "A" command
99116
              ORG
                      $15BF
                               Patches into
00117
              LDU
                       #LOAD
                               the "L" command
```

*I.C. BREADBOARD NOT INCLUDED **NY. STATE RESIDENTS ADD SALES TAX

```
99118
               ORG
                       $15C4
                               Patches into
00119
               LDU
                       #WRITE the "W" command
00120
               ORG
                       $1637
                               Patches into
00121
               LEAU
                       LOAD.PCR
99122
               BRA
                       $15D7
                               the "V" command
00123 *
99124 *
00125 *Alter the error handling routine to
00126 *account for new error messages
99127
               ORG
                       $1721
00128
               LBSR
                       ERROR
                                Compute error code
99129
               CLR
                       $1
                                Clear some flags
00130
               CLR
00131
               LEAX
                       ERRS, PCR List of messages
00132
               LBSR
                              Print error message
                       $121E
ØØ133 *
00134 *
00135 *Fix input routine so that if you
00136 *respond to "FILENAME?" prompt by
90137 *hitting Break, you will be returned
00138 *to the Editor or Zbug properly
00139
               ORG
                       $1EFØ
00140
               LBEQ
                       $172F
00141 *
09147 *
00143 *Make Zbug's "P" command write
90144 *to disk, by using the ROM routine
99145 *that normally processes the Basic
00146 *statement "SAVEM"
00147
              ORG
                       $1609
00148
                       $FFDF
               CLR
                               Select ROMs
99149
              JMP
                       $CEA2
                               Use ROM routine
00150
               ORB
                       $31AD
                               Eliminate a tage
00151
              NOP
                               Filename check
00152
               NOP
00153
              NOP
00154
              NOP
00155
              NOP
99156 *
ØØ157 *
00158 *Make Ibug's "L" command load
00159 *from disk, by using the ROM routine
90160 *that normally processes the Basic
00161 *statement "LOADM"
00162
              ORG
                       $163F
                               The offset is in U
00163
              PSHS
                               Put offset on stack
00164
              LDU
                       #LOAD
                               Set the filename and
00165
              LBSR
                       $1509
                               Open file for input
00166
              PULS
                               Retrieve the offset
00167
              PSHS
                       ŊΡ
                               Save Direct Page
00168
              CLRA
                               Clear the Direct
00169
              TFR
                       A.DP
                               Page register
00170
              STX
                       $D3
                               Store the offset
00171
              CLR
                       $FFDE
                               Select ROMa
00172
                               Use ROM routine
              JSR
                       $CFØ7
00173
              CLR
                       $FFDF
                               Turn on 64K
00174
              PULS
                       DP.PC
                               Restore DP & return
00175
              ORG
                       $31A4
                               Eliminate a tape
```

score high on the SA **GRE or AC**



The Test Preparation Series that combines Computer Software, Review Textbook and User's Manual into the most comprehensive Study Program available today!

- Makes studying for the exam easy
- makes studying for the exam easy and enjoyable
 Builds test-taking skills quickly in planned systematic program
 Simple and easy to use even for those with no computer experience.

COMPUTER SAT Preparation

- Special Features
 1000 Electronic Vocabulary-Building Flash Cards
- •540 Computer Drill Items

Complete Textbook

- "How to Prepare for the SAT" 470
- pages
 -Four Full-Length Exams—enter
 answers in computer for instant scoring and diagnosis
- Complete verbal and math categories
 Strategies for answering every kind
 of question

User's Manual

Clear, simple documentation inte-grates textbook and software

Computer Software

- Scores and times your performance · Calculates College Board equivalent
- Diagnoses your strengths and weak-nesses in 15 key areas of study
 Prescribes specific drill and review on computer and in the textbook to improve your score

Available For

- ¥TRS-80 Model III */4 * with 48K
- Apple* with 48K IBM* PC Atari 800*/1200*
- Commodore 64¹

COMPUTER GRE Preparation

This program helps prepare under-graduates for the Graduate Record Examination

- Apple[®] with 48K · 3 double-sided diskettes with Graphic
- Displays

 *HBJ's popular text *How to Prepare for the GRE*
- •A totally understandable, "User friend-ly" User's Manual

COMPUTER ACT Preparation

- 480 page text "How to prepare for the ACT"
- •3 double-sided computer diskettes •50 page User's Manual •Apple® with 48K

COMPUTER SAT Preparation @ \$79.95

- available for

 TRS-80 Model III*/4* with 48K

 Apple* with 48K
- ☐ Atari 800®/1200® ☐ Commodore 64®

COMPUTER GRE Preparation @ \$89.95 available for Apple® with 48K

COMPUTER ACT Preparation @ \$89.95 available for Apple® with 48K

FOR CREDIT CARD ORDERS CALL TOLL-FREE 800-543-1918

(In California call collect (619) 699-6335)

Please add \$2.00 for handling (UPS delivery guaranteed). Please add applicable state and local sales tax. (Institutions must send purchase order to be billed.) Offer restricted to Continental USA and Canada.



Harcourt Brace Jovanovich, Inc.

Dept. Computer SAT R-9-83, 1250 6th Avenue, San Diego, CA 92101

Available at Computer and leading Bookstores

99176	RTS	Filename check
00177 *		
ØØ178 *		
		'V" command into an "F"
00180 *com	mand which o	does a disk directory
00181	ORG	\$2EAB Zbug's command table
ØØ182	FDB	DIR-\$2D4E Address of command
ØØ183	FCC	*F* Change "V" to "F"
ØØ184 *		
ØØ185 *		
99186 *Wipe	e out some (calls to tape related
00187 *rou	tines in RO	M that are no longer needed
ØØ188	ORG	\$14FD
00189	NOP	
ØØ19Ø	NOP	
99191	NOP	
00192	ORG	\$162B
00193	RTS	
ØØ194 *		
00195 *		
90196 *Alt	er the keyb	oard input routine so
00197 *tha	t we may de	fine a custom cursor
ØØ198	ORG	\$1519
00199	LDB	#CURSOR Get cursor character
99299	EORB	#BLINK Blink it if necessary
00201 *		
00202 *		
002 0 3 *Mak	e EDTASM+ u	se our routines instead
00204 *af	those conta	ined in the ROM



Presents

"JUDE"

A full text, commentary & Ref. study on the Epistle of St. Jude. It speaks to the heart of 20th century America. A must for Pastors, Sunday School Teachers, any serious student of the "WORD". Req. 32K E.C.B.

Cassette \$13.99 Disk \$16.99

Educational 3-game Pack Books of the Bible (memory aid) game, Bible character word scramble game & "Who Said That" Bible quote game. Req.16K E.C.B. Cassette \$10.99 Disk \$13.99

Church Contribution System. Req.32K E.C.B. Disk Only \$49.95

> Buy Quality Christian Oriented Software.

> > Ut-1 Utility

For line printer VII & DMP 100 10 TRECDEFGHIJKLM&bedefghtuklm12345* 10 TLINE PRINTER UII DUMP 10 'LINE PRINTER VII DUMP

Lists programs generating 125 characters by 90 lines. Reg. 16K E.C.B.

Cassette \$14.99 Disk \$17.99

We pay freight C.O.D. ADD \$2.00 003

Send solf addressed stamped énvelope for full list of programs P.O. BOX 1899 Duncan, Ok. 73533 (405) 255-5696

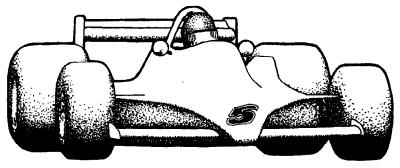
99296 LBSR INPUT Input from a device 99297 ORG \$1690 00208 LBSR INPUT 00209 ORG \$155D 00210 LBSR CLS Clear the screen 00211 ORG \$1524 00212 LBSR KBSCAN Scan the keyboard 00213 NOP 00214 ORG \$1589 00215 LBSR **KBSCAN** 00216 NOP 00217 ORG \$157E 00218 LBSR OUTPUT Output to a device 00219 NOP 00220 * 99221 * 00222 *Modify "Q" command to reenable ROMs 90223 *before attempting to return to Basic 00224 ORG \$1505 00225 CLR \$FFDE Select ROMs 99226 CLR \$FF40 Turn off disk drive 09227 JMP \$AØ27 Jump into Basic ØØ228 * 00229 * 00230 ORG \$E00 ØØ231 * 00232 * 00233 *New entry point to EDTASM+ 00234 START LEAX \$38FF,PCR Find bottom of mem 99235 TER X.D Round off to even 00236 CLRB Increment of \$100 Set memory pointer 00237 STD \$FF 00238 LEAX NMI.PCR Use our own interrupt 00239 STX \$10A Service routines 00240 LEAX IRQ, PCR Instead of those 00241 \$1ØD STX In the ROM 00242 LBSR \$1558 Clear the screen 00243 LDB #VERIF Set up disk system's 00244 STB \$987 Verification system 00245 LDB #DEFALT Select which drive 00246 STB \$95A Will be the default 00247 LDX #BAUD Select the printer's 00248 STX \$95 Serial baud rate 00249 LBRA \$1005 Enter EDTASM+ 00250 * 00251 * 90252 *Subroutines called by the program 00253 *patches to enable the new features ØØ254 * 00255 * 00256 *Close any open disk files 00257 CLOSE CLR \$FFDE Select ROMs 00258 JSR \$CA3B Use ROM routine 00259 CLR \$FFDF Turn on 64K 99269 RTS Return 00261 * 00262 * 00263 *Patches for the Editor and Ibuq 00264 ECLOSE BSR CLOSE Close files

00205

ORG

\$154C

YOUR COLOR COMPUTER JUST GOT WHEELS!



REVOLUTION!

You accelerate hard down a long straightaway, braking heavily at the end for a hard corner. You slice smoothly through the esses, and then boldly keep the power on for a fast sweeper. The Ferrari drifts dangerously near the edge, but you make a tiny correction in the steering, and you are through.

The finish line flashes by, and suddenly you are in the pits. The car falls silent. You see your lap times being held up. Your final lap was a new lap record! At last, you permit yourself a small smile.

You have mastered this powerful car on a difficult track, driving with the assurance and precision that comes only from long hours of practice.

You are driving an <u>authentic</u> race car. You are playing Revolution!

FANTASTIC ACTION

Revolution uses high resolution, machine language graphics for action that is smooth and fast. The emphasis is on authenticity in the control and motion of your car. As in driving a real race car, accuracy and precision in your driving are what counts. Frills and non-essentials have been left out.

PURE COMPETITION

Like a real race driver in practice and qualifying sessions, you compete against the clock and against the existing lap record for that track. *Revolution* records the lap records and the name of the person who set the record, so you always know who reigns supreme on your favorite track!

DESIGNED WITH YOU IN MIND

Revolution is menu-driven, and self explanatory. Information screens tell you what you need to know. When you're ready to play, a menu of the names of all your tracks is displayed, along with the lap record for each track and the name of the person who set that lap record. You select a track with a single keystroke, and Revolution takes you there.

A NEW CONCEPT

Revolution is a unique game, because it allows you to create the most important part of any race game: the track itself.

The first time you run Revolution, you will be able to choose from several tracks and cars which are included with the game.

But, with Revolution, this is only the beginning! You can create as many tracks as you like. You can make each new track as difficult or as easy as you wish. You can make easy ones to begin with, and tougher ones as you become more skilled. You may find creating tracks to be almost as much fun as driving on them!

You can save your favorite tracks to run on again whenever you wish. *Revolution* will automatically add these new tracks to the menu. And you can exchange your favorite tracks with other *Revolution* owners.

Be careful, though, about letting your friends play this game. They may not want to let you have your computer back!

THE EARLY REVOLUTION

A prototype version of *Revolution* was published in the September, 1982 issue of Rainbow magazine, under the name *The Track*. The response to *The Track* has been terrific.

Revolution has all the features that have made The Track a favorite, and Revolution's fast, high-resolution machine language graphics are dramatically improved over the prototype's.

REVOLUTION NOW!

The original *Revolution* for the TRS-80TM Color Computer requires 32K and one disk drive. A new cassette version has action just like the disk version, and similar track-saving features excluding a menu of available tracks. The cassette version will run on a 32K Color Computer or TDP-100. You can upgrade to the disk version later, too, for a nominal fee.

REVOLUTION

For 32K Disk \$24.95 For 32K Cassette ... \$21.95

Requires Joysticks & Extended BASIC

Connecticut residents add 71/2% sales tax. TRS-80 is a trademark of Tandy Corporation.









99265		LBRA	\$1377	Return to the Editor
00266	ZCLOSE	BSR	CLOSE	Close files
99267		LBRA	\$1387	Return to Ibug
00268	*			•
99269	*			
00270	*Routine	e to allo	w you to	enter a name
				, the address
				this program
				sition independent.
	FNAME			Put address in D
00275		LEAU	\$Ø,PCR	Calculate the offset
99276		LEAU	D,U	Add it to the address
00277		PSHS	U	Save the address
00278		LEAX	PROMPT, P	CR "FILENAME?"
00279		LBSR		Print the prompt
99289		CLR	\$16	Clear input counter
00281		LBSR	\$1EC6	Get user's input
ØØ282		LDB	\$12	Get length of input
ØØ283		LDX	\$13	Get address of input
ØØ284		PSHS	DP	Save the Direct Page
ØØ285		CLRA		Clear the Direct
ØØ286		TFR	A, DP	Page register
00287		LEAY	BACK, PCF	R Save a return
99288		PSHS	γ	Address on the stack
00289		CLR	,-S	Lower the stack
00290		LDA	\$95A	Select the default
09 291		STA	\$E8	Drive number

CY-BURNET-ICS

Specializing In Educational Software For TRS-80 COLOR COMPUTER

CLOCK ARITHMETIC—for kindergarten through third grade; auto load; menu selects hour, half hour, quarter after, quarter till, randomizing by fifteen minutes, 5 minutes, or by the minute; computer shows time by clock face and student gives digital time; H key and spacebar provide hour and minute help; Q key returns to menu; graphic and musical rewards provided.

SIDE 1—DRILL

SIDE 2—CLASSROOM TUTOR

SIDE 1—DRILL SIDE 2—CLASSROOM TUTOR MINIMUM REQUIREMENTS 32K EXTENDED BASIC \$24.95

MULTIPLICATION DRILL—for second grade through high school; auto load and menu driven (1 × 1 thru 2 × 9, 1 × 1 thru 5 × 9, 1 × 1 thru 9 × 9, 0 × 0 thru 12 × 12; and 0 × 0 thru 15 × 15); timed, scored, with two chances for correct answer; graphic and musical rewards provided. **MINIMUM REQUIREMENTS 16K EXTENDED BASIC** \$24.95

BEAT THE COMPUTER—for third grade thru adult; auto load; timed drill on the multiplication tables 0×0 to 12×12 . Program is divided into 4 sequential parts: 1) factors 1×1 thru 6×6 ; 2) 0×0 thru 12×12 ; 3) 6×6 thru 9×9 ; and 4) 10×10 thru 12×12 . Musical reward upon beating computer; An exciting way to learn. Revised May 83.

MINIMUM REQUIREMENTS 16K EXTENDED BASIC \$19.95

**SPECIAL OFFER THROUGH DEC. 31, 1983

**BOTH MULTIPLICATION DRILL
AND BEAT THE COMPUTER FOR \$19.95

ALSO AVAILABLE CASSETTE
Number Readiness Drill 19.95

Number and Color Word Drill 19.95

 ALSO AVAILABLE CASSETTE

 Number Readiness Drill
 19.95

 Number and Color Word Drill
 19.95

 Graphic Alphabet/Audio
 24.95

 Numbers Before, Between and After
 24.95

 Addition Drill
 24.95

ALL programs developed by educators and field tested. Add \$1.00 per cassette for shipping and handling. Tennessee residents add 6% sales tax. Send self addressed stamped envelope for free brochure. Mail Check or Money Order to:

CY-BURNET-ICS

5705 Chesswood Drive, Knoxville, TN 37912 Phone 615-688-4865

ØØ292		LDY	#\$94C	Name storage area
00293		LDA	* \$20	ASCII space
00294	ERASE	STA	, Y+	Clear out the
00295		CMPY	#\$957	Filename storage
ØØ296		BNE	ERASE	Area
ØØ29 7		CLR	\$FFDE	Select ROMs
99298		JMP	\$C8A4	Use ROM routine
00299	BACK	CLR	\$FFDF	Turn on 64K
00300		PULS	DP,U,PC	Restore and return
00301	PROMPT	FCC	*FILENA	ME?*
00302		FCB	\$AØ	Terminator
00303	*			
00304	*			
00305	*Routine	s to ope	en a disl	c file.
99396	*Note t	ne slight	t differ	ences for
00307	*Load, V	Vrite, ar	nd Assemb	ole.
0039B	LOAD	LDA	#\$49	(I)nput mode
ØØ3Ø9		LDX	#\$1FF	ASCII format
00310		BRA	OPEN	Open the file
00311	WRITE	LDA	#\$4F	(O)utput mode
00312		LDX	#\$1FF	ASCII format
99313		BRA	OPEN	Open the file
00314	ASSEM	LDA	#\$4F	(0)utput mode
99315		LDX	#\$200	Binary format
00316	OPEN	STX	\$957	Store the format
99317		LDX	#\$100	The record length
00318		STX	\$97C	is 256 bytes
00319		LDB	#\$1	Use device #1
00320		CLR	\$FFDE	Select ROMs
00321		JSR	\$C468	Use ROM Routine
00322		CLR	\$FFDF	Turn on 64K
99323		RTS		Return
00324	*			
ØØ325				
				outine to
			k relate	d errors:
	* DF 1		NP FN I	
				of those,
				ID error.
	ERROR	CLR	\$FFDF	Turn on 64K
99332		EXG	A,B	Put the code in A
00333		CLRB		Clear B
99334	AFTERN	LEAX		CR List of errors
	SETERR	CMPA	B, X	Compare the codes
00336		BEQ	RET	Return if they match
00337		TST	B, X	Check for end of list
99338		BEQ	RET	Return if end of list
99339		INCB	OFTERR	Move to next code
99349	DET	BRA	GETERR	Compare next on list
00341 00342		RTS		Return
99343				
		f error (roder	
	CODES	rerror (FCB	538	Nick Luli
99346	החתבם	FC8	\$48	Disk full
99347		FCB	\$48 \$34	Verification error
99348		FCB	\$3C	File not found Write protect
00349		FCB	\$3E	Bad filename
99359		FCB	\$2A	Bad file mode
ØØ351		FCB	\$2H \$00	Signal end of list
22001		, 00	*1111	Aiduar sun at 112(

99352	*			
00353				
		of error m	essaces	
00355		FCC	*DISK FL	JLL*
9 9356		FCB		Terminator
00 357		FCC	*VERIF.	ERROR*
9 9358		FCB	\$AØ	Terminator
00359		FCC	*FILE NO	IT FOUND*
99369		FCB	\$AØ	Terminator
0 0361		FCC	*WRITE F	PROTECT*
00362		FCB	\$AØ	Terminator
00 363		FCC	*BAD FIL	_ENAME*
99364		FCB	\$AØ	Terminator
99365		FCC	*BAD FIL	
99366		FCB	\$AØ	Terminator
99367		FCC	*I/0 ERF	
99368	_	FCB	\$AØ	Terminator
00369				
99379				
99372		ne to do : LDX	8 015K 01 \$ 13	
99373	אזע	CLRA	112	Get user's input Device #0 (screen)
<i>99</i> 374		DEC	\$12	Was device specified?
99375		BMI	DR1	Skip ahead if not
00376		LDB	, X+	Examine specification
99377		CMPB	#\$50	Was it a "P"?
99378		BNE	DR1	Skip ahead if not
00379		LDA	#\$FE	Device #-2 (printer)
00380	DR1	STA	>\$6F	Select the device
ØØ381	*The "	>" in the	above 1:	ine is crucial!
99382		LDA	\$95A	Get the default drive
ØØ383		DEC	\$12	Was drive specified?
00384		BMI	DR2	Skip ahead if not
ØØ385		LDA	, X	Get specification
ØØ386		ANDA	#\$3	Convert from ASCII
ØØ387	DR2	PSHS	DP	Save the Direct Page
00388		CLRB		Clear the Direct
99389		TFR	B, DP	Page register
00390		STA	\$EB	Select the drive
00391		CLR	\$FFDE	
00392		JSR	\$CBD2	Do a directory
00393		CLR	\$FFDF	Turn on 64K
00394 00395		CLR PULS	\$6F	Reselect screen Restore and return
00396		FULD	NL 1 LP	עבפנטוב מוות ובנתווו
ØØ397				
		ine to inp	ut ∔rnm	a device
	INPUT			Select ROMs
99499		JSR		Use ROM routine
00401		CLR	\$FFDF	Turn on 64K
00402		RTS		Return
00403				
99494				
00405	*Rout	ine to out		
	OUTPU'		\$FFDE	Select ROMs
00407		JSR	[\$A002]	Use ROM routine
99498		CLR	\$FFDF	Turn on 64K
9949 9		RTS		Return
99419				
00411	*			

00412	*Routine	e to scan	the key	/board
00413	KBSCAN	CLR	\$FFDE	Select ROMs
ØØ414		ANDCC	#\$AF	Enable interrupts
00415		LDA	#\$35	Enable the control
99416		STA	\$FFØ3	Register in the SAM
00417		JSR	[\$A000]	Use ROM routine
00418		PSHS	CC	Save the status flags
88419		CLR	\$FFDF	Turn on 64K
00420		PULS	CC,PC	Restore and return
00421	*		•	
99422	*			
00423	*Routin	e to clea	ar the so	creen
00424	CLS	CLR	\$FFDE	Select ROMs
ØØ425		JSR	\$A928	Use ROM routine
99426		CLR	\$FFDF	Turn on 64K
99427		RTS		Return
00428	¥			
99429	*			
99439	*Non-ma	skable i	nterrupt	service routine
00431	NMI	LDA	\$982	Check status flags
00432		BEQ	EXIT	Exit if invalid
ØØ433		LDX	\$983	Get transfer address
00434		STX	\$ØA,S	Put it on the stack
00435		CLR	\$982	Clear the flag
00436		RTI		Return from interrupt
00437	*			·
00438	*			
ØØ439	*60 cyc	le inter	rupt ser	vice routine
00440		LDA	\$FFØ3	
	-			

FRUSTRATED WITH FOLD-OUTS? MADDENED BY MANUALS? DON'T CURSE YOUR CURSOR! SEND FOR THE VERY BEST COLOR COMPUTER REFERENCE SYSTEM HELP! provides the BEGINNING PROGRAMMER with every basic command for the COLOR COMPUTER. the COLOMPOTER. Each command is indexed by what it **does** as well as what it is called. Every major command is shown with its formula, examples of how it it used, a full set of notes, common pitfalls, and references to the instruction manual. HELP! provides the more ADVANCED PROGRAMMER with the perfect reference system for checking less familiar commands. It can also serve as a translation of Basic into Color Basic. 232 pages, ring-bound, lies flat on computer. **REAL SOFTWARE** P.O. BOX 486 NORTHBORO, MA 01532 PHONE: (617) 393-6281 Please send HELP! Enclosed find \$9.95 plus \$1 shipping. NAME_ ADDRESS .--CITY __ __ STATE__ ZIP_ MASTER CARD OR VISA CARD # __ EXP. DATE___ SIGNATURE_ Massachusetts residents add 5% sales tax R-1

	BPL	EXIT	Exit if invalid
	LDA	\$FFØ2	Reset the latch
	LDA	\$985	Check drive status
	BEQ	REPEAT	Skip if motor is off
	DEC	\$985	Decrease motor timer
	BNE	REPEAT	Skip if not done
	LDA	\$986	Time to shut off
	ANDA	#\$BØ	Disk drive motor
	STA	\$986	Update motor status
	STA	\$FF48	Shut off drive
REPEAT	LDX	#\$152	Start of key data
RP1	LDA	, X+	Check a row of keys
	CMPA	#\$FF	Are any pressed?
	BNE	RP2	Go if key is pressed
	CMPX	#\$15A	Was that the last row?
	BNE	RP1	Loop back if not
-	INC	KCLEAR,	PCR Increment counter
	LDA		PCR Has keyboard been
	CMPA	#\$6	Clear for .1 second?
	BNE	EXIT	If not, exit routine
	CLR	KCLEAR,	PCR Clear the counters
	CLR	KHOLD, P	CR
	BRA	EXIT	Exit the routine
RP2	INC	KHOLD, P	CR Increment counter
	LDA	KHOLD, P	CR Has key been held
	CMPA	#RATE1	·
	BNE	EXIT	If not, exit routine
	SUBA	#RATE2	Prepare counter for
	REPEAT RP1	LDA LDA BEQ DEC BNE LDA ANDA STA STA STA REPEAT LDX RP1 CMPA BNE CMPX BNE INC LDA CMPA BNE CLR CLR CLR CLR CMPA BNA	LDA \$FFØ2 LDA \$985 BEQ REPEAT DEC \$985 BNE REPEAT LDA \$786 ANDA #\$BØ STA \$986 STA \$FF4Ø REPEAT LDX #\$152 RP1 LDA ,X+ CMPA #\$FF BNE RP2 CMPX #\$15A BNE RP1 INC KCLEAR, LDA KCLEAR, LDA KCLEAR, CMPA #\$6 BNE EXIT CLR KCLEAR, CLR KHOLD,P BRA EXIT RP2 INC KHOLD,P CMPA #RATE1 BNE EXIT



your mission is to establish friendly relations with a newly discovered race. Nothing is known about this new race, but you must determine where their home world is located and if they will be peaceful members of the Federation. The Klingons also have heard of these creatures and want to stop you! This program is actually a series of 4 graphics and text adventures. It totals over 86K making it one of the largest programs of the CoCo. The graphics may well set a new standard for the CoCo or any computer looking more like color paintings than computer graphics. This program uses the full control of PMODE4 false color developed by OWL-WARE DEALERS INQUIRIES INVITED

Software Authors Wanted-Highest Royalties Paid

\$1.25 Per Order Postage & Handling

All Orders Receive

10% Voucher On Order



OWL-WARE P.O. Box 116

Mertztown, PA. 19539

PA. Res. Include 6% Tax

99469		STA	KHOLD, PO	CR The next repeat
99479		LDX	#\$152	Start of key data
ØØ471	RP3	LDA	, X	Check one row
99472		ORA	#REPRES	Make all keys seem to
ØØ4 73		STA	, χ+	Have been re-pressed
00474		CMPX	#\$15A	Was that the last row?
90475		BNE	RP3	Loop back if not
00476	EXIT	RTI		Return from interrupt
99477	#			
00478	*			
99479	*Counter	s for re	epeating	keys
ØØ48Ø	KCLEAR	FCB	Ø	
00481	KHOLD	FCB	Ø	
00482	Ť			
ØØ483	*			
<i>0</i> Ø484	*The ke	y repeat	routine	is an adaptation
ØØ485	*of a p	rogram b	y Charles	s Roslund which
<i>9</i> Ø486	*appear	ed in the	e Sept. 1	1982 RAINBOW.
00487	*			
ØØ488	*			

Listing 2:

00489

'Utility to transfer EDTASM+

START

- 'text files from tape to disk
- 3 CLS
- 4 PRINT"EDTASM+ SOURCE CODE"
- 5 PRINT"FILE TRANSFER UTILITY"
- 6 PRINT STRING\$(32,"=")
- CLEAR500, 16308: DEFUSR0=16310
- B FOR X=16310 TO 16318
- 9 READ Y:POKE X,Y

END

- 10 NEXT X
- 11 DATA 173,159,160,4
- 12 DATA 173,159,160,6
- 13 DATA 57
- 14 PRINT"ENTER THE NAME OF THE"
- 15 LINEINPUT"TAPE FILE: ": I\$
- 16 PRINT
- 17 PRINT"ENTER THE NAME OF THE"
- 18 LINEINFUT"DISK FILE: ";O\$
- 19 AUDIO ON: OPEN"I".#-1, I\$
- 20 OPEN"O",#1,0\$:GOTO 22
- 21 X=USR(0):MOTOR OFF
- 22 IF PEEK(129)>0 THEN 29
- 23 IF PEEK(124)=255 THEN 30
- 24 X\$=CHR\$(Q):X=VARPTR(X\$):
- 25 POKE X,PEEK(125)
- 26 POKE X+2,1:POKE X+3,218
- 27 PRINT X\$;:PRINT#1,X\$;
- 28 GOTO 21
- 29 PRINT"?IO ERROR":GOTO 31
- 30 PRINT"TRANSFER COMPLETE"
- 31 CLOSE: END

PETROCCI FREELANCE ASSOCIATES



Inspector CLUEseau

Sherlock Holmes/Agatha Christie fans-It's finally here—A murder mystery game for the 80-C! Mr. Goodbody has been killed in his mansion and you must solve the mystery. WHO committed the murder, WHERE did it occur and HOW was it done! Question suspects, find the secret passage, and break the code to get clues. Hi-Res graphics enhances this excellent game. The computer records the clues you obtain on a clue inventory screen and also provides suspect descriptions at the touch of a finger. A fast, fun game that will sharpen your deductive skills. Every game is different!



Bowling Secretary

Save hours of tedious work with this efficient program. Calculates individual player average, high game and total pins, as well as team games won/lost, high series, and cumulative total team points. Also calculates team standings for each week in order from 1st to last! All data stores to tape and outputs to printer to provide professional, easy to read copy. After intitial input of league and player names all you have to do is input each week's scores - the computer does the rest!!!

16KEXT Cassette \$24.95 32KEXT Disk 29.95

Heart-Lung-Circulatory Systems

A difficult subject becomes easy to learn. Programmed learning approach divides subject content into concise frames of information. Hi-res graphic display with labelled anatomical structures follows text frames for added clarity. Visually highlights keywords and concepts. Self test questions follow each section. Provides immediate feedback to user response and displays correct answers before moving to new

★ PATTI-PAK ★

2 Intermission Screens (Fireworks & Chase)

Extra Man Every 10,000 pts.

★ 16K Machine Language ★



Invisible Maze Every 4th Screen

Difficulty Level Auto-Increases As You Progress

> Just Like The Arcade And More!

> > **★** \$21.95 ★

HURRICANE TRACKER

New!

Plots up to three hurricanes simultaneously on hi-res map.

Excellent graphic display.

2nd program provides hard copy printout.

16KEXT Tape\$15.95

16KEXT Disk\$19.95

WEATHER WATCH

Calculates Nat'l Weather Service Statistics. Great for Science Projects and Hobbyists. Well formatted printcut.

 16KEXT Tape
 \$24.95

 32KEXT Disk
 \$29.95

WEATHER FORECASTER

Special Price 32KEXT Disk \$19.95

★ KIDS KORNER ★

Big Bigger Biggest

........ 16KEXT Tape \$9.95 ABC's 16KEXT Tape \$9.95 123's 16KEXT Tape \$9.95 Shapes ... 16KEXT Tape \$9.95

All four for \$24.95

★ INVESTORS ★

Real Estate Investment

(Residential Income Property)

BOND YIELD

Helps you find "best buy" in selecting bonds. You select several bonds for comparison and program calculates yield to maturity for each. You will see surprising variations and use of this program will spot "true bargains" in the bond market. Well Documented. Printer Output Option.

Include \$1,50 for handling for each program.
Az Residents add 6% Sales Tax.
Quantity Discounts to Dealers.



STRESS EVALUATOR

Measures your stress level and illness potential.

Coping Ability Test/Goal Setting Exercises Excellent Graphic Charts/Meditation Screen Printer output option

MEDICAL TERMINOLOGY

Most Common Suffixes and Prefixes.
Abbreviations used in Hospital Charting.
Choice of Study/Self Test/Definition Readout
32KEXT Tape \$19.95
32KEXT Disk \$24.95

STAGECOACH (Ages 8-12)

Deliver Annabelle and the Gold to the Judge.
But watch for Indians and the James Gang!!
16KEXT Tape\$19.95
32KEXT Disk\$24.95

ASTROLOGY CHART PRINT Now for LPVII & EPSON MX80

Full Size Graphic Printout from user input of planetary positions and house cusps. Prints Comparison Charts around Natal Accommodates Placidian, Equal House, Modified Equal

Epson MX80 Version requires GRAFTRAX 32KEXT Tape\$21.95 32KEXT Disk\$26.95

This Peripheral Acquaintance

Is A Real PAL

By Paul S. Hoffman

There's a new piece of hardware on the block, a real PAL for your TRS-80 Color or TDP-100 computer. The new addition from Tandy Towers in Fort Worth is the Color Computer Multi-Pak Interface (CCMI). It's a PAL in several ways. For one, it'll allow you to switch between four different Program-Pak cartridges without turning off the computer; for another, you can select a slot either through hardware (a four-position switch on the front panel) or software (four different *POKEs* to a single memory location); another reason to call CCMI a PAL is that it contains a chip called a PAL ("Programmable Array Logic" device #PAL 1414, a "semi-custom IC which may be programmed for specific functions" — quote from the CCMI Service Manual).

The unit plugs into the cartridge slot on the right side of the computer, and passes all the signals in parallel to all four slots, except for CCS (Cartridge Select Signal) and SCS (Spare Chip Select). These two signals are routed through the select latch, hardware switch and PAL to determine which slot will be operational. Power is provided through a separate cord—one more socket needed in the computer corner!—and, again, we can't tell by a quick look whether the baby is on or off! No power on/off indicator light, I'm sorry to say. The recommended power-up procedure is to turn on all peripherals (certainly the Multi-Pak Interface) before turning on the computer. When powering down, turn the computer off first, then all peripheral devices.

Certainly a major advantage to having a device such as this is the ability to have a Disk Controller permanently attached, not needing to constantly "pull the plug" on it to use a ROM Pak or the X-Pad. (I can't tell you how many times I've had a disk crash due to a faulty connection!) But it gives you a bit more flexibility than that, since you have four slots available. With the flip of a switch, I can have:

SLOT 4: Disk BASIC with X-Pad (Disk Controller plugged in here)

SLOT 3: Extended BASIC with X-Pad (X-Pad plugged in here)

SLOT 2: Micropainter

SLOT 1: Anything else—maybe *Poltergeist* for those breaks between work sessions.

Tandy suggests that the Disk Controller (if you have it) go in slot 4 (toward the rear of the Interface). I suspect that this is simply because of the controller's size—it would be quite awkward to reach around it to plug or unplug another Pak. The same thing goes, as far as I'm concerned, with the X-Pad Controller, which is the same size. Put bigger cartridges in back, smaller in front.

Notice that in the configuration I listed above, the X-Pad works both in Disk BASIC and in the slot it's plugged into. It actually functions regardless of which slot has been selected, because it doesn't depend on the two select lines used to pick a slot, and functions in a specially allocated area of memory. At this date, this is the only peripheral sold by Tandy which functions like this. Similar items would be real-time clock ROM Packs currently offered by other companies.

After some experimentation, I've cataloged four major potential uses for the Multi-Pak Interface:

- 1) Switching to and from Extended BASIC, Disk BASIC and ROM Cartridges.
- 2) Copying ROM Cartridges to RAM or tape for study/modification.
- 3) Saving Graphic screens from graphically oriented ROM carts or games.
- 4) Operating fully-decoded "special I/O" devices (such as X-Pad) simultaneously with Disk.

The software *POKE* for selecting a slot is to location 65407 (\$FF7F).

POKE 65407,0 for slot 1

POKE 65407,17 for slot 2 POKE 65407,34 for slot 3

POKE 65407,51 for slot 4

If you look at how those numbers are represented in hex (\$00, \$11, \$22, \$33), you'll see that the high-order nybble (bits 4 through 7) duplicates the low-order nybble (bits 0 through 3). This is because the CCMI uses bits 0 and 1 to determine which slot gets the CTS signal, and bits 4 and 5 to route the SCS signal. Both signals have to go to the same slot for proper selection. The actual address used for this selection process (65407) is determined by the programming of the PAL chip. There seems to have been a last-minute change in that programming, because the Owner's Manual for the Interface lists the address as 65439 (\$FF9F). An addenda sheet corrects the address. The strange thing about it is the most of the time 65439 seems to function exactly the same as 65407—writing to it will change the slot, and 65407 will mirror the change. Also, reading either location can tell you which slot has been selected by the switch. If you haven't done a software *POKE*, the address will contain 204 (\$CC), 221 (\$DD), 238 (\$EE) or 255 (\$FF) for slots 1, 2, 3 or 4. In other words, the front panel switch fills in bits 2, 3, 6 and 7 as well as creating the proper bit-pattern in 0, 1, 4 and 5.

In general, the hardware switch is the easiest way to switch slots, but frequently it is necessary to press the RESET button on the computer to start a program. Some programs (such as Disk BASIC and the new Deluxe RS-232C Program-Pak) don't automatically send the computer a CART signal and need to be nudged with "EXEC & HC000."

Software selection (by doing the *POKE* to 65407) overrides the switch. Once you've done a *POKE*, you can slide the switch back and forth at will, to no effect. RESET will return control to the switch (unless programming has altered the reset vector).

To look at (for the purpose of study or modification) the program in a ROM Pak, put the cartridge in one slot (WHILE THE COMPUTER AND CCMI ARE OFF), then place the switch in position to select an empty slot (Extended BASIC). After turning the CCMI on and then the computer, do the ROM Pak disable POKE (POKE &hff23,36). Then software-select the ROM Pak by POKE-ing the appropriate value into 65407. At this point, the ROM Pak program can be accessed starting at address \$C000. If you have a RAM-based monitor program or disassembler, you can now load into the computer and examine/disassemble the addresses above \$C000. If you have 32K or better, you can move the program down in memory to an unused area of RAM, and then save it to tape for further study or modification.

This is certainly the safest, best way to examine ROM-based programs, since it does *not* involve plugging ROM Paks in while the computer is on. (While testing what the CCMI will and won't do, I stupidly unplugged the X-Pad with power on and zapped my 6809 CPU—I also had the Disk attached to the same slot through a Y-connector and managed to zap the Disk ROM. DON'T PLUG OR UNPLUG ANY CARTRIDGE WITH THE POWER ON!)

The matter of exploring graphics created by ROM Pak programs can be quite interesting. If you play a ROM Pak game or use a graphically oriented ROM Pak program (Logo, Micropainter, Art Gallery, Graphic Pak, etc.), you can switch out of the program into an empty slot (using the front-panel switch) and the graphics will be retained in memory. If you do a lot of graphic programming, you might already have been able to identify the mode used in the ROM Pak you've selected. Chances are it'll be either

PMODE 4, PMODE 3 or PMODE 1. A simple program like Listing 1 will display part of the computer's graphics memory and help you find where the ROM Pak has stored its pictures. The program will run continuously, showing you various sections of Extended BASIC's graphics memory. When you see what looks like the right graphic configuration, press any key. The computer will print on the screen all the pertinent information. If you have a screen print program, you could dump the picture to a printer, or you can save the picture to tape by using the indicated starting and ending addresses in a CSAVEM command.

CSAVEM "TITLE," start address, end address, 413 (413 contains a decimal 57—"return from subroutine" code—so that if you accidentally try to EXEC a saved picture as though it were a machine language program, the execute address—413—will return the computer to where it was without crashing).

Many ROM Paks will have their graphics area offset slightly from Extended BASIC's. In these cases, you might have to do a "block move" of the memory forward or backward to coincide with one of Extended BASIC's graphic pages. For example, Art Gallery pictures end up being in PMODE 1, but they start before page 1. In fact, they start at \$400, the beginning of the text screen. The program in Listing 2 will move the picture down on the screen, but you will not be able to recover the top 512 bytes (the text screen has clobbered them).

Since Extended BASIC's "pages" are 1536 bytes long, you might not get a graphic from a ROM Pak to line up properly with the start of a page. While running Listing 1, look for the



most complete picture, then press any key. If the picture was too high on the screen, key in and run Listing 3. If the picture is still too high, press BREAK and then RUN it again.

If the picture is too *low* on the screen, type in and *RUN* Listing 4, repeating as many times as necessary.

All of this business of looking at, moving and copying graphic screens leads naturally into the subject of using the Multi-Pak Interface to link the X-Pad with Disk. An addendum to the CCMI Owner's Manual says, "Graphic displays created while using the X-Pad . . . can be saved on disk . . . Read the three corresponding values per the X-Pad manual to load the display. Once completed, the finished display can be saved using the SAVEM command." The middle sentence of what I've quoted is absolute nonsense—I suppose the reference is to the three addresses the X-Pad uses for X coordinate, Y coordinate and pen status—and the last sentence, while correct, leaves much to be said. Both the SAVEM and the CSAVEM command need three addresses as parameters: start address, end address and execute address. The X-Pad manual, unfortunately, gives an absolute value for the start of graphics memory (\$600) and calculates addresses from that. The problem is that Disk BASIC reorganizes the graphics area, putting it initially 2K higher in memory (starting at \$E00). It also could get shoved even higher if you've used the FILES command to allocate more disk buffer space. Goodness knows where the start of graphics could end up! So how do you find out where it is? The same way Disk BASIC does: You look at the pointers to graphics memory that BASIC sets up.

\$BA = start of current graphics page

\$B7 = 1 byte past end of current graphics page

\$BC = start of graphics memory

This means that the format for saving to disk should be:

SAVEM "TITLE", PEEK(&HBA)*256, *PEEK*(&HB7) *256-1,413

A picture saved from Extended BASIC (using CSAVEM) will most likely (if it is started on graphics page 1) be coded to load back in starting at \$600. If you try to load this picture in while Disk BASIC is operational, it will write over Disk BASIC'S I/O buffers and only be partially visible on the screen (or not at all if it was in a low-resolution mode). Such a picture must be OFFSET LOADED. The format for the command is:

CLOADM "TITLE", PEEK(&HBC)*256-&H600

The formula after the comma is there to calculate the number of bytes of offset (subtracting the original starting address from the new starting address to get the difference).

On the other hand, pictures saved to tape while running Disk BASIC will need to be offset loaded in a different way if you want to use them without the disk. Their addresses are too high (normally by 2K bytes), and the offset has to "wrap-around" the top of memory. The correct format for loading such a picture from tape is:

CLOADM "TITLE", &HC000

To summarize, the CCMI is a fine buy for the price (\$179.95). It has the additional advantage of buffering all of the ROM port connections, leaving your SAM and CPU a bit more protected (though that didn't keep my stupidity from destroying a CPU). Possible disadvantages are that the buffering chips (74LS367s) and the PAL chip are highly susceptible to damage from static electricity. Just make sure you follow the rules of good computer maintenance, and you'll enjoy additional flexibility—and fewer disk crashes due to poor contact!

Listing 1:

5 GOT017Ø

10 FORM=0TO4: MODE #

20 FORP=1TO5: 'PAGE #

30 FORS=0TO1: SCREEN COLOR SET

40 PMODEM, P: SCREEN1, S

5Ø FORX=ØT01ØØ: 'DELAY

6Ø IFINKEY\$<>"THEN12Ø:'LOOK FOR KEYPRESS

7Ø NEXTX

80 NEXTS: 'NEXT COLORSET

90 NEXTP: NEXT PAGE

100 NEXTM: 'NEXT MODE

110 GOTO10: 'REPEAT

120 CLS:PRINT"PMODE";M;", PAGE";

125 PRINT"SCREEN 1,";S

13Ø PRINT"SCREEN STARTS AT &H";H

EX\$ (PEEK (&HBA) *256)

140 PRINT"SCREEN ENDS AT &H"; HEX

\$ (PEEK (&HB7) *256-1)

15Ø END

17Ø PCLEAR8:GOTO1Ø

Listing 2:

5 PMODE1,1:SCREEN1,Ø

10 FORM=&HFFF TO&H600 STEP-1

20 POKE M+&H200, PEEK (M)

3Ø NEXTM

4Ø FORM=&H7FF TO&H6ØØ STEP-1

50 POKEM, 0: 'PAINTS TOP PORTION S

AME AS BORDER COLOR

6Ø NEXTM

7Ø GOTO7Ø

Listing 3:

5 PMODEM, P:SCREEN1, S: REPLACE TH E VARIABLES IN THIS LINE WITH TH E CORRECT MODE #, PAGE # AND COL ORSET # FOUND BY USING LISTING 1 10 FORX=PEEK(&HB7) *256-1 TO PEEK (&HBA) *256 STEP-1

2Ø POKEX, PEEK (X-&H2ØØ)

3Ø NEXTX

4Ø GOTO4Ø

Listing 4:

5 PMODEM, P: SCREEN1, S: 'REPLACE THE VARIABLES IN THIS LINE WITH THE CORRECT MODE #, PAGE # AND COLORSET # FOUND BY USING LISTING 1 10 FORX=PEEK(&HBA) *256 TO PEEK(&HB7) *256-1

20 POKEX, PEEK (X+&H200)

3Ø NEXTX

4Ø GOTO4Ø

LEARN A SECOND LANGUAGE ON YOUR COLOR COMPUTER • NEW • EXCITING • EASY

Creative Courseware using the latest technology and Professional Programming

- Fulfill your educational objectives
- Have fun learning a new language
- Expand your children's horizons.
- Improve your job potential
- Young and old can learn
- Affordable, only pennies per hour.
- SEE High quality visuals, not dotted graphics
- HEAR High quality audio as spoken by natives
- UNDERSTAND Through programmed instruction
- RESPOND Branching, and looping insure learning.

Lessons Now Available in Spanish, English and French

- Color Computer with 16K RAM and tape recorder required
- SLU-1: People, Persons & Family
- SLU-2: Stand, Walk & Run
- SLU-3: Smile, Eat & Talk
- SLU-4: House
- SLU-5: Open & Closed
- SLU-6: Furniture & Appliances
- SLU-7: Meals
- Vocabulary #1, 2 & 3: 200 words each

Other Lessons and Languages Available Soon

Special Values

Special Value #1

SLU 1-3, VOCAB 1, and Lesson Control A \$129.75 Value for only \$99.95. SV-1 (specify language desired)....\$99.95

Special Value #2

SLU 1-7, VOCAB 1-3, and Lesson Control A **\$249.45** Value for only **\$199.95**. SV-2 (specify language desired)...\$199.95

Individual Lessons:

Lesson Control: (only one copy needed for all lessons and languages)

LC-CC\$49.50

HOW TO HEAR AND THINK IN A SECOND LANGUAGE

Skilled linguists have developed our series of second language programs. The lessons utilize the power of programmed instruction wherein you are advanced to new material only after satisfactory learning has occurred at the current level. Our techniques teach you how to think in a language without initially using any printed text material. No mental translation to your native language is required. You learn as a child does, hearing and speaking before reading. The computer both tutors and keeps track of progress as it moves you forward (or backward when review is necessary). AUDIO plus VISUALS plus INTERACTIVE RESPONSE establish the learning process, and literally THOUSANDS of visuals help seal-in the sound patterns of your new language.

All of our lessons are interactive and user friendly; yet, you are unaware of the complex course structure involved. For example: Lesson SLU-1 uses the theme of PEOPLE, PERSONS & FAMILY to teach the use of nouns to name things, to classify them into categories, and to identify members of a group. Sentence structure is developed using the verb 'be' and its relationship to nouns and adverbs, including plural forms and inversions. Noun structure using definite and indefinite articles, and regular and irregular plural forms is also presented. The other lessons are similarly designed. In addition, each VOCABULARY LESSON presents approximately 200 visuals and 200 words that are integrated into the learning process.

While the foregoing might seem complex, and it is, IT IS ALSO THE REASON OUR COURSEWARE CAN TEACH LANGUAGES. If you have tried 'game' or 'tape' language programs you know that they are ineffective. Our programs can teach you a language because we have successfully combined expert authoring of programmed courseware with **audio & visuals & response & branching** into a powerful tutorial package.

DEALER INQUIRIES ACCEPTED

Our Lessons Teach You to

These lessons are for you if you:

Have had previous difficulties

HEAR and THINK in a

Think you can't learn

Want to start out right

Want language success

Second Language

We have a broad range of Audio Visual Computer Aided Instruction under development. Some users of our courseware might include Day Care Centers, Schools (public and private), institutions in various categories, individuals and language tutors.

ABSOLUTELY NO RISK

You may examine your order for 15 days. If you decide not to take advantage of the lesson(s) simply return in good condition for a full refund or cancellation of credit card charges.

*WE PAY UPS IN USA

(street address required for UPS) *Add \$2.00 if US Mail desired.

*Add 15% for foreign, APO & FPO (Remit in US Funds)
*Virginia Orders add 4% sales tax
*Mail credit card orders please include all card information

WE ACCEPT

- VISA and MASTER CARD
- Money Orders
- Certified Checks
- Other Checks (must clear before shipment)

FREE ORDER LINE 1-800-368-6300

FOR VIRGINIA ORDERS AND OTHER CALLS: 1-804-463-6300

BASIC PROGRAMS, INC. 236 Mustang Trail, #102 Virginia Beach, VA 23452

EDUCATION OVERVIEW

Jetworking FOR Bettep Software Evaluatio

By Michael Plog, Ph.D.

ne major problem with computer use in education (especially the Color Computer) is the lack of knowledge about quality software.

Now, let's get it correct. I am not talking about the lack of existence of quality software, just the lack of knowledge about quality software.

Software purchase is not a minor concern, especially for schools with severe budget constraints. How do school people make decisions about purchasing software? Several ways.

The first is blind faith. Armed with a limited checkbook, the brave purchaser reads advertisements, looking for small details which might give a clue to the actual operation of a program. A selection is made, purchase order typed, signed through the bureaucratic structure, and in a few weeks, the product is delivered. Sometimes the selection is ideal; it fits the needs of the person ordering it, and works without a single problem. Sometimes, however, the selection is less than perfect. If it works, the stipulated definitions by the author are much different than the concepts used by the person ordering it. Yes, there are snake oil salesmen out there, ready to take your money for a product that might be totally useless.

The second way of ordering software—usually employed after a few negative encounters—is the informal sharing of experience. Other owners of the Color Computer are called; notices are given at club meetings. Sometimes the seeker gets lucky using this method, and someone is found who has already purchased the software in question. Now, the

(Michael Plog received his Ph.D. degree from the University of Illinois, the M.S. from Memphis State University, and the B.S. from the University of Tennessee. For his foreign/research language option required for the doctorate, he naturally selected computer language. Michael currently works for the Illinois State Board of Education as a research and evaluation specialist.)

informal sharing provides a single review, but at least by a known source. Since theft is not uncommon among endusers of computers, some purchasers do not have to buy anything, but obtain a copy of a program, often with inadequate instructions.

Occasionally, a third (far superior) method of software selection is used—the review. The potential purchaser gets a chance to look at the product, try it out, maybe even get a chance to spend enough time to work completely through the program. The problem with software review is that it is so limited. We can all do it at our local Radio Shack store, for the programs in stock. The problem is that this is a very small slice of available products for the Color Computer. Even if some of you are lucky enough to have a third party software dealer nearby (I am not), selection is still limited. In addition, I have seen teachers and principals reviewing educational software, but I have never seen a teacher bring in students to sit at the keyboard and try the products.

All three of these selection methods—reviews, informal experience sharing, and blind faith—can work well and will continue to be part of the human decision process. There is another way, however. I am recommending the creation of a national network for educational software evaluation to be conducted via the Rainbow. It is only coincidence that this notion is given birth with an issue devoted to education. This coincidence may be a good omen for the success of the project.

Say the words aloud once or twice: a national network for educational software evaluation. No cute acronym for the project, but a sincere request for cooperation from readers of *the Rainbow*.

Please notice the evaluation form. Simply put, the idea is for any of you (hopefully, many of you) to complete the form on educational software you have. Completed forms will be collected at a central location, and periodically, results will be provided in *the Rainbow*. Then, the fourth method of software selection (the national evaluation) can be added to the other three methods.

PRETTY PRINTER

This M/L utility program will allow you to write your code in as compact a form as you wish, but list it to the screen or printer in an easy to read 'PRETTY PRINT' format. Turn this: —

10 PRINT "EXAMPLE": FORX=ATO M:FORY=STO P:Z=X + Y:PRINTZ:NEXTY:NEXTX

Into this: - 10 PRINT "EXAMPLE": FOR X = A TO M: FOR Y = S TO P: Z = X + Y: PRINT Z: NEXT Y:

NEXT X
With one simple command.

CAT. NO. DM001 16K Ext \$12.95

P.U.F.F.

Say the magic word and P.U.F.F. your print formatting problems dissappear. The Printer Utility File Formatter turns any word Processor (that produces ASCII text files) into a super printer formatter. Embedded codes will perform the following functions: —

- Send control codes to your printer.
- Set left and right margins at any time.
- Set headers and footers.
- * Left, Right and Fill Justify.
- Centre the next 'n' lines.
- Temporary indent (neg or pos).

Plus many other features.

CAT. NO. DM002 16K Ext \$24.95

KEYBOARD OVERLAYS

Many programs are supplied with keyboard overlays to help you keep track of the various commands used by the program. Now you can add overlays to your own programs or to commercial programs that did not come with this feature. Die cut to fit the standard Color Computer keyboard. Dealer inquiries for blank or custom printed overlays are invited. CAT. NO. HW002 99¢ each

DATAMAIL

The ultimate cassette based mailing list program for home or business use. Fully customized data collection screen allows you to set your own field lengths and field titles. Fast machine language sort by any column in any field. Save all or any block of files for latter reading by DATAMAIL or your own letter program. Merge two or more lists, search by record number or key word in any column. One key commands for Input, Kill, Change. Print single records or any block of files, 1, 2, 3 or 4 across. 32K holds about 300 files.

CAT. NO. DM003 16K Ext \$14.95

FIRST SAMPLER

Six programs for the price of one. All have been published in popular computer magazines and are now available on one tape at this special price.

- MATH Improve your mental math skills
- WORD Make words from the supplied letters in this game for the whole family.
- this game for the whole family. '
 CONVOY Can you sink the computers convoy before it sinks yours?
- * BAGIT Train your memory to remember the things you put in the bag.
- * VECTORS Row your boat across the river without going over the falls.
- AHHA Find the treasure chest in Another Haunted House adventure. Don't get caught by the Old Miser's ghost.

CAT. NO. DM005 16K Ext \$9.95

COCOCOPY

This all M/L Program will copy BASIC or M/L programs including most Auto Start Programs. It will supply the beginning, ending and offset addresses and allow you to change the load address for M/L programs. I/O errors are ignored so that bad tapes can be corrected. Programs can be renamed and the motor/audio functions are controlled from the keyboard.

CAT. NO. DM004 16K Ext \$12.95

SEND \$2.00 FOR OUR 25 PAGE CATALOGUE

Refunded with first order

We are dealers for the following fine companies: -

- ARK ROYAL GAMES
- COMPUTER ISLAND
- D S L COMPUTER PRODUCTS
- DYNAMIC ELECTRONICS
- FRANK HOGG LABORATORIES
- HOMEBASE COMPUTER SYSTEMS
- HOME RUN COMPUTER PRODUCTS
- LITTLE BITS COMPUTING SERVICES

- MARK DATA PRODUCTS
- NELSON SOFTWARE SYSTEMS
- RAINBOW CONNECTION SOFTWARE
- SPEECH SYSTEMS
- SUGAR SOFTWARE
- THE PROGRAMMERS
 GUILD
- TOM MIX SOFTWARE
- WEST BAY COMPANY

BOOKS from SYBEX * BYTE * OSBORNE * RESTON



Box 431, Sta. B Hamilton, Ontario Canada L8L 7W2 1-416-529-1319

ALL PRICES
IN CANADIAN
DOLLARS

EVALUATION FORM for the COLOR COMPUTER

Name of Software:				Price:		
Marketed From:						
Minimum System Needed Amount of RAM Number of Disk Drives Color Set Needed Printer Joysticks			-		plied on: ROM I Tape Diskett	ML
Purpose (check all that a) Interactive Instruction Teaching About Cornection of Material Management of Instruction Administrative Management Data Exchange Other	on nputers s ruction agemen	t of I				Subject Matter (check all that apply) Computer Learning Foreign Language Game/Simulation Language Arts Math Science Social Studies Other
Pre-Sc	Circle A	ll Mo	ost A	ppro	opriate Cla 4 5 6	sses for use of Software: 7 8 9 10 11 12 Adult
Pre-Sc Rate the Software on eac ("1" = poorest; "5" = best How Easy to Operate	h of the	follo "= N Very Poor	owing Not A	iter ppli	ms. (cable) Very Good 5	sses for use of Software: 7 8 9 10 11 12 Adult Major Strengths:
Pre-Sc Rate the Software on eac ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions	hool I	following for the following fo	2 owing Not A 2 3 2 3 2 3	iter ppli 4 4 4	ms. cable) Very Good 5 5 5	7 8 9 10 11 12 Adult
Rate the Software on each ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions Completeness of Instructions How Well Does It do the Job It is Supposed To	h of the ;; "N/A N/A N/A N/A N/A	following for the following fo	2 owing Not A 2 3 2 3 2 3 2 3 2 3	iten pplii 4 4 4 4 4	ms. cable) Very Good 5 5 5	7 8 9 10 11 12 Adult Major Strengths:
Pre-Sc Rate the Software on each ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions Completeness of Instructions How Well Does It do the Job It is Supposed To	h of the ; "N/A N/A N/A N/A	Follow Footh 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 owing Not A 2 3 2 3 2 3 2 3 2 3	3 4 4 4 4 4 4	ms. cable) Very Good 5 5 5 5	7 8 9 10 11 12 Adult Major Strengths:
Pre-Sc Rate the Software on each ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions Completeness of Instructions How Well Does It do the Job It is Supposed To Interest Level for	h of the ; "N/A N/A N/A N/A N/A	For the content of	2 Dwing Not A 2 3 2 3 2 3 2 3 2 3 7 Over	3 itempolic 4 4 4 4 4 4 4 4 4 Trall	4 5 6 ms. (cable) Very Good 5 5 5 5 Grade For	Major Strengths: Major Weaknesses: This Software:
Rate the Software on each ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions Completeness of Instructions How Well Does It do the Job It is Supposed To Interest Level for	h of the ; "N/A N/A N/A N/A N/A	For the content of	2 wing Not A 2 3 2 3 2 3 2 3 2 3 2 3 2 3	3 itempolic 4 4 4 4 4 4 4 4 4 Trall	ms. (cable) Very Good 5 5 5 5 5 5 5 5	Major Strengths: Major Weaknesses:
Rate the Software on each ("1" = poorest; "5" = best How Easy to Operate Use of Color Use of Graphics Clarity of Instructions Completeness of Instructions How Well Does It do the Job It is Supposed To Interest Level for	h of the ;; "N/A N/A N/A N/A N/A N/A N/A	e follower follower for the follower for	2 Dowing Not A 2 3 2 3 2 3 2 3 2 3 7 Ove	iten ppli 4 4 4 4 4 4 7 rall	ms. locable) Very Good 5 5 5 5 Grade Forms	Major Strengths: Major Weaknesses: This Software:

Think of the advantage of this national evaluation method for people trying to buy educational software. Instead of one or two reviews for educational software, many can be available. Instead of trying to outguess a developer's definition of "screen controlled directions easily understood by a first grade student," actual experiences can be examined. For the isolated Color Computer user (and I imagine most of us are), knowledge of people from all parts of the country, and possibly other countries.

I do not want to spend too much time on the benefits of such a system. Let's look for a minute at what evaluation means in this context. An evaluation is a description and *judgment* of a particular software package. Without the judgment, there is no evaluation. (Evaluation's middle name is "value.") Take a look at the evaluation form.

First, the description of the software package. We have to identify what software is being evaluated, thus the blanks for the name and who markets the package, as well as other items such as price, necessary system, and how supplied.

Notice the portion of the form called "Purpose." These are categories of uses of programs. For a more complete explanation of each, dig out your last month's *Rainbow* and check out the article there. In order to get a full description of the software, we need to know the purpose. *Logo*, for example, would have the purpose of "Interactive Instruction" and "Teaching About Computers"; students operate the keyboard and command the computer to do certain things. A word processing package, as another example, could be used for "Administrative Management of Information," or even for "Interactive Instruction" in a typing class. A file management package would most probably have the purpose of "Management of Instruction" (to keep grades, test records, etc.). A program creating a word search would be "Creation of Materials." You get the idea, right?

The portion of the form titled "Subject Matter" needs little explanation. You may not want to check any of these, depending on the purpose of the software. For example, "Creation of Materials" could be for any subject matter. Likewise, "Administrative Management of Information" might not be related to any single subject matter. If the software is related to a particular subject matter, please note it.

To complete our description of the software (and to start reporting your judgments about the package), supply your best estimate for the appropriate classes to use the software. For a word processing package, you might want to circle 7 through adult, or even start with a lower age/class.

The other items on the form ask for your judgments about the software. Rate the software on the seven criteria listed. We are asking for your judgments; do not be afraid to be honest here. This is an evaluation of educational software, so we want you to "grade" the package.

Finally, identify your relationship to schools. Perspectives of different groups may vary, which is valuable information to potential buyers.

So much for the description and judgment of the national network. Now for the network part. The network, dear reader, means you! This idea will not work unless you complete and mail in those forms. I will collect the forms and provide an analysis after a substantial number come to me. (The analysis, naturally, will be conducted using my

Color Computer.) The data will be entered and stored using a File System, and the analysis provided with a BASIC program.

Please mail your completed form to: Michael Plog, 829 Evergreen, Chatham, Ill., 62629. Unfortunately, I cannot provide a reward for completed forms, not even the stamps necessary to mail the information to me. We will have to rely on your interest and involvement as a concerned Color Computer user. I happen to think most of you readers are interested and involved.

One other note. I do not know how many times we will print the evaluation form in *the Rainbow*, so please make copies of the form. Feel free to make as many copies as you wish. I do not like to destroy my magazines (I save all my *Rainbows*, don't you?), so I highly encourage making copies. In fact, if you want to pass out the form to school people, feel free to make several copies.

By way of a final remark and quick update, Radio Shack has completed an agreement with the Minnesota Eduçational Computing Consortium (MECC) to convert selected programs from the MECC educational courseware library to the Model III and Color Computer. Some of you may know about MECC; they have a national reputation for leadership in educational software. We look forwared to the results of this agreement.

Until next month, think evaluation—think education!



COMPUTER BUSINESS FORMS

Continuous forms, labels, paper, checks, invoices, statements—all with your imprint. Continuous letterhead with a perf so fine that you need a magnifying glass to tell it's a fan fold sheet.

Matching envelopes.

Regular letterhead, business forms and cards also.

Send sample for quote. Send \$3.00 (refundable on first order) for our catalog.

Catalog also includes computer furniture.

DESERT PRESS, INC.

P. O. Box 15128 Las Vegas, Nevada 89114



Drawing On This Blackboard Chalks Up Programming Ease. By Joseph Kolar Rainbow Contributing Editor

"This is such a simple program that even the person not too familiar or enthusiastic about programming could use it to create his/her own displays."

The object here is to allow anybody, within the constraints of this program, to create their own programs. It appears to have some benefit when used as a blackboard for individualized instruction. There is no need to get into the arcane depths of computing to produce creditable results. It allows a person to create a display that they visualize in their mind's eye without the attention to programming conventions that are usually required. It is unencumbered with excess impedimenta and elegant touches. In a word, it is simple.

The program is for use on the hi-res screen of the 16K ECB Color Computer. All variables are double letters. The first letter is the code for the option and the second letter is the name of the letter or number called.

A Code—Capital letters and numerals of the script alphabet.

B Code—Small letters of script.

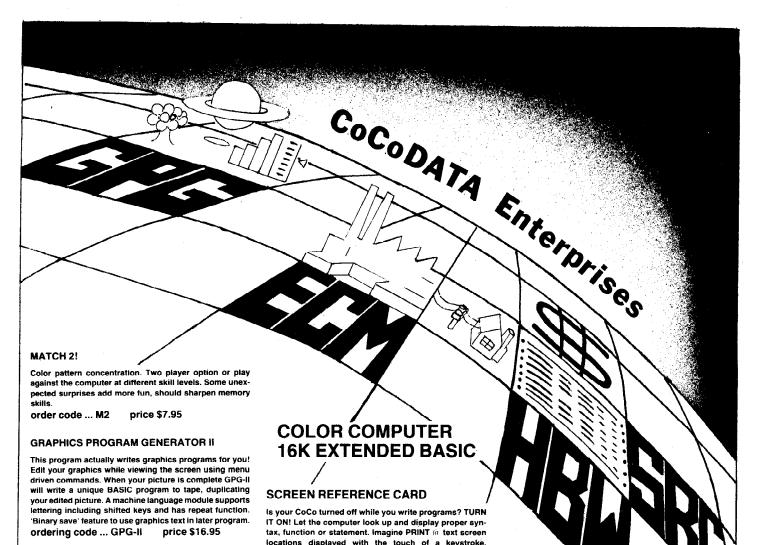
C Code—Alternate small script letters. (optional)

K Code—Upper case and numerals of the print alphabet.

N Code—Lower case of the print alphabet.

Varied Codes—Spacers and punctuation marks.

Both alphabets may be used on the screen at the same time. A maximum of 20 printed letters and 25 script letters fill an entire row, provided you use "S8" size option, in the *DRAW* statement. S8 is recommended; S12 is good and S4 may be used, but not recommended.



HOUSEHOLD BUDGET WORKSHEET

If you have a CoCo and any printer, don't be without this inexpensive money management helper! Operates without a separate file, yet loans are automatically updated with months remaining and new balances. Provisions for variable income/expenses and one time income/expense; user defined budget catagories. All figures incorporated into calculations 'visa-caic' style.

order code ... HBW price \$6.95

LLIST-RITE

Complex, non-commented programs (like someone else's) are much easier to follow after using this listing utility! Multiple and IF...THEN...ELSE are logically separated, line numbers are set apart from text, page boundaries observed. Works with any CoCo Printer.

order code ... LLR price \$5.95

ELECTRICITY CONSUMPTION MONITER

Want to reduce your electric bill? You can't manage it if you can't measure it. This program utilizes your CoCo to store consumption information and then produce Hi-Res graphic usage charts, text displays of the last 30 days in KWH or DOLLARS with high low and average days. Predicts your next bill with increasing accuracy as the month progresses.

ordering code ... ECM

price \$10.95

PROGRAMMERS WORKSHEET

order code ... SRC

Can't remember variable assignments/descriptions or subroutine location/purpose? You're not alone! Our worksheet, designed to become the front page only of your new program makes proper techniques as easy as 'rapid writing'. The longer, more complex your program, the more headaches you'll save with this form! Use your office copier to reproduce the original you receive.

graphics patierns, X/Y coordinates, ASCII codes and

price \$7.95

order code ... PWS price \$1.50 (ONLY \$1 WITH S.A.S.E. !!!)

SUPER BONUS PAK

All our fine programs on separate cassettes with manuals and the Programmers Worksheet for \$49! ... and we pay all shipping and handling. You save over \$13

order code ... SBP price \$49 (no shp&hdg)

Low cost, high quality programs Color Computer Weekly 3/83

May I compliment you on a fine program and return policy

Letter 5/83 (GPG-II)

ECM offers a lot more than the advertisements suggest ... very neat, compact energy monitering routine ... nice BASIC programming techniques

RAINBOW REVIEW 4/83

...radical...fun...powerful...a breeze to

RAINBOW REVIEW 6/83 (GPG-II)

...the price is a small one to pay for an item that will make your computing a happier experience...deffinately impressive

RAINBOW REVIEW 4/83 (LLIST-RITE)

Include 75¢ shipping and handling for **each** item ordered except the Super Bonus Pak and Prog. Workst.



Mail check or M.O. to: CoCoDATA Enterprises 1316 Quail Avenue McAllen, Texas 78504

Name____ Address_

City, ST ZIP

Items ordered: SBP GPG-II ECM M2 SRC HBW LLR PWS

THE FUTURE OF HOME COMPUTING IS PROGRAMS THAT ENLIGHTEN, TEACH, SAVE & MANAGE

Nine rows will fit comfortably on the screen, providing you use S8, begin at a vertical coordinate of 20 and increment +20 for each row to provide adequate spacing. On the horizontal, if indenting, use 15 or 20, otherwise, 5 leaves plenty of space at the left margin.

The DRAW command is used in every program line. If size is not changed during the program, it need only be put into the initial DRAW statement. The first line would begin: DRAW "S8BM15.20."

To concatenate the name "Joe" in print, you would add to the above *DRAW* line: +KJ\$+NO\$+NE\$. This means concatenate (+), capital printed letter, (K), name of letter, (J), concatenate, (+), small printed letter, (N), name of letter, (O), concatenate, (+), small printed letter, (N), name of letter, (E).

Due to the large overhead, only three screen pages of print/text are possible. The two sets of numerals are somewhat similar and one set could be deleted to conserve memory. If I remember correctly, some of the punctuation marks are duplicated. A few could be deleted. The spacer works well with any option.

This is such a simple program that even the person not too familiar or enthusiastic about programming could use it to create his/her own displays. Concatenation serves the bill very nicely. The program lines, beginning at line 2000 would consist entirely of *DRAW* statements, except for the last line on each display page. The variables are so coded that the programmer can easily follow and locate his position when looking at the listing. All she/he has to do is read the second letter of the variable. Reading the second letters will indicate exactly what is being written or printed to the screen. Thus, it is easy to locate and correct a mistake. In the interest of

COLOR **COMPUTER Buyers Club** Members enjoy a 30 - 40% savings on software! More being added monthly! Hardware & accessories at substantial savings! Monthly specials and reviews! Special orders service for members! No service charge for VISA or MC! Your savings can far exceed your dues! Join Today And Start Saving! Dues are \$22.50 - We accept Personal Checks, M.O. or Charge It! CITY _____ STATE ____ ZIP ____ □ VISA □ MC Exp. Date _____# Mail to: Color Computer Buyers Club P.O. Box 241 Eaton Rapids, MI 48827

saving memory CLEAR 450 is good, so far, but CLEAR 500 appears to be good all the time.

When RUN, the program will display the first page. To proceed to the next page, press the G key. Do the same to get to the third page. Another press of the G key and it will recycle to the first page. It may be held at the end of the third page in an infinite loop.

Everything is printed or written via concatenation. Begin a new program line after two lines of concatenated variables are added to the *DRAW* statement. (Sixty-four spaces or two rows on the screen.) Much more than that will get an LS

"Everything is printed or written via concatenation. Begin a new program line after two lines of concatenated variables are added to the DRAW statement."

error message. It is better to be reasonable and not try to cram as many variables into a program line as possible. You will only have to backtrack and lop off a few variables and start a new program line anyway.

Reaching the end of a row, (right-hand margin) requires a new program line. The "follower" line must begin with DRAW and the next variable need not have + prefixed, but all the following concatenated variables must have the + in front of the variable.

There is a third case when you are likely to need an additional *DRAW* program line. When creating two columns of text on the same screen line, it is easier and neater to use a new *DRAW* statement with the coordinates to locate the first letter of the second column. If alignment is not necessary, you can insert +"BRN" where N is a number, to move over N spaces to the right. Try any number, N, check it out and adjust left or right by increasing or decreasing N. Then continue to concatenate.

Briefly, to use this program, delete lines 2000-2999. Locate and size the starting program line at 2000 inside the quote marks of a DRAW statement. Then concatenate about 10 variables, not forgetting any spacer variables. RUN it and see how it looks. Then, begin a new program line with DRAW. No quote marks! Continue to concatenate. If you concatenate about 10 more variables, you will be approaching the right-hand margin. Check it out to make sure you don't run off the screen. Reposition the second row using the same system as line 2000. Make sure you increment the vertical by +20 to insure adequate spacing between rows.

If you use 20 as an increment, you can easily locate a program line by counting by 20s and check the *DRAW* statement in the listing that has a vertical element the same as the one you just counted out. It is also a good idea to increment each second and possible third program line in the same row, by an odd number. This gives a good clue as the program's lines will indicate if it is a "starter," 2000, 2010, even number or a "follower" line, 2005, 2007, 2015, 2017, odd numbers.

At the end of the last *DRAW* program line on a screen display page, add: *GOSUB* 3020. This will hold the display until you are ready to proceed. Press the G key.



Computer Island

DOLLARS & SENSE

16K Ext.

Learn to make purchases. Graphic displays of items kids love. Player buys using dollars and coins to practice using money correctly. Solutions given.

McCOCO'S MENU 16K Ext. America's favorite pastime - going out to eat! Learn to buy and add up your purchases from a typical fast food restaurant menu. Gain skill in using money. Different prices each time.

MONEY-PAK 32K Ext. This is a menu-driven merged version of the above 2 programs. Also includes play money for extra rein-

GRAPH-IT by David Steele 16K Ext. Allows the user to graph algebraic equations including

linear, quadratic, higher order equations. Multiple and systems of equations can be graphed simultaneously.

Hi-Res Graphic display.

to learn

LONG DIVISION TUTOR by Ed Guy 16K Ext. Basic \$14.95 A tutorial that takes the child through all steps of the example. Includes HELP tables, cursor aids, and graphic aids. Input your own numbers, or let the computer choose the example. Three levels of difficulty. Great teaching program!

MULTIPLICATION TUTOR by Ed Guy 16K Ext. Basic Similar type tutorial to the above. All carries indicated. Teaches examples from one to three place multipliers.

FACTORS TUTOR by Ed Guy 16K Ext. A program to help teach the skill of factoring. 4 levels. Learn about factors, prime numbers and G.C.F. Help command available at each step. Makes factoring fun

FRACTIONS TUTOR by Ed Guy 16K Ext. \$19.95

Step by step instruction in addition of fractions. 4 levels of difficulty. If you need help, use "Help" commands throughout each step of the example. Great for learning, practicing and reinforcing this skill.

THE BEST IN SOFTWARE FOR KIDS!

BEYOND WORDS 32K FCB \$19.95 Fach These Language Arts programs cover common misspellings, and synonyms/antonyms on each level. Additionally, Level 1 tests contractions and abbreviations, Level 2 tests homonyms, and Level 3 tests analogies. Each program has 3 parts and contains over 400 questions and uses over 800 words. All tests are grade appropriate. User modifiable (directions included). Printer

Level 1 Grades 3-5 Level 2 Grades 6-8 Level 3 Grades 9-12

VOCABULARY BUILDERS 32K ECB \$19.95 Each 200 Vocabulary questions on appropriate grade levels in a 4 part multiple choice format. 1000 words used. Extensive research has provided challenging words on all levels. When mastered, the words may be changed by the user (full directions included). Printer option.

Level 1 Grades 3-5 Level 2 Grades 6-8 Level 3 Grades 9-12

On Disk

Beyond Words 1 and Vocab. Builder I Beyond Words II and Vocab. Builder II \$38.95 \$38.95 Beyond Words III and Vocab. Builder III \$38.95

\$17.95 Each Each reading program contains 50 situational paragraphs with one key word missing. Child uses context clues to find correct answer in multiple choice format. Random selection of readings each round. Available for 4th, 5th, 6th, or 7th grade. Please specify.

READING AIDS 4-Pak A 4 part menu driven program for the Elementary school child to create his own original reading material. Includes the 4 popular programs — POETRY, SILLY STORIES, SILLY SENTENCES and WIZARD, now expanded to 16K Extended Basic.

A BYTE OF COLOR BASIC A work-text manual that will help the programming newcomer begin to write his own programs. Practice exercises and answer key.

FOREIGN LANGUAGE BASEBALL 16K ECB-200 words-\$11.95 Each 32K ECB-500 words-\$19.95 Each 6

Score base hits or home runs for correct answers. You're out if wrong. User modifiable. A fun way to learn and practice vocabulary. Specify FRENCH, SPANISH or ITALIAN.

MUSIC DRILL 16K FCB

by David Steele \$19.95

Learn to identify the notes of the scales of most popular major and minor keys. Drill on sharps and flats, hear the notes of the scale and work against the timer. A must for all music students.

KNOW YOUR STATES

by James Keeling \$19.95

High-res graphics portray each state for you to identify. If you can't, try the "help" command where you can see the state's position within the entire United States. Choose the number of states you want to try and see your score at the end.





Preschool Series 16K ECB by Joseph Kolar \$11.95 Ea. on Cassette \$15.95 Ea on Disk All 3 on disk - \$38.95

Pre. #1 Clowns and Fishnum. 2 programs to reinforce counting and number recognition.

Pre. #2 Countkid and Addpenny. 2 programs to help with counting and beginning addition. More advanced

Pre. #3 Alpha-Byte. 3 programs each covering a part of the alphabet for letter recognition.

HEBREW BULLETIN BOARD 16K Ext. \$15.95 by Joseph Kolar

A utility that will enable YOU to create Hebrew or Hebrew/English words, flash cards, sentences, greeting cards, etc. in Hi-res. Easy to learn-full documentation. For hard copy, use your printer and any screen print program.



THE WIZARD NOW SPEAKS

THE TALKING WIZARD 16K Fxt \$19.95 A talking version of our popular WIZARD game. This is a child size (Eliza-Freud) type game. Input any question and the WIZARD writes and now SPEAKS (through the T.V. speaker) an amusing answer. Great for reading practice or just plain fun.

voice by-Classical Computing Inc.



SPECIAL - CLOSEOUT of Creative Computing's never released software for the CoCo. 2 Hi Res machine language, joystick controlled arcade style games. PICNIC (escape spider, capture food), TRICKASHAY (tank duel in a tricky maze). 1 or 2 players, multi-level. 16K Ext. Both for an incredible \$11.95



RAINBOW

COMPUTER ISLAND DEPT. R 227 Hampton Green Staten Island, N.Y. 10312

FUN AND GAMES \$11.95 Each

CIRCUS - 16K - A kid's graphic adventure. Ages 5-10. SCHOOLMAZE - 16K - Kid's adventure. Draw pictures, play basketball in school setting. Ages 5-10.

COCOJOT - 16K - Color Computer Jotto game. Family fun. Ages 8-adult.

GHOST - 16K ECB by S. Rosen - The famous word game. Ages 8-adult.

HORSE RACE by R. & P. Armstrong 16K Fxt Race your horses and beat the odds. Up to 6 players and 6 races to a set. Hi-res graphics.

SOFTWARE FOR SPECTRUM'S LIGHT PEN

KID'S FUN-PAK: This 3 program game set will entertain you with a great new dimension for your computer. Tutorial included with documentation. Kid's Fun-Pak Tape 16K Ext.

Light Pen and Tape

\$14.95 \$34.95

leisure or learning. Write for details. Top royalties.

(212) 948-2748

Please add \$1.00 per order for postage

N.Y. Residents, please add proper tax

FREE set of BINARY DICE, including full directions. with orders of 2 or more items.

DEALERS INQUIRIES INVITED

Authors: We are seeking quality children's software for

When you get to the very last line in your program (2000) block) you have the choice of holding the last screen display or returning to the starting page.

If you want to hold at the last screen display, at the end of your final line, add: GOTO 3010. If you want to return to the first page, add: GOSUB 3020. Then press the G key.

That's it! Pretty easy, huh?

After using this system a few times, it is almost a joy, and certainly satisfying to key in any desired information. There is so little to remember. Since the variables are coded, practically the entire system can be committed to memory. Feel free to redesignate the variables that govern the punctuation marks and spacers to suit yourself. For that matter, you can change the code letters, if you prefer some other codes.

Note that the C coded letters should be examined and if not desired, deleted from the program to save memory. The B coded letters begin at the base line and the C coded letters begin at the top of the small letters. Key in DRAW "S8BM100,80"+CO\$+CN\$+BO\$+BN\$ and see the differ-

V	// 150	01D3
Ĭ		0556
1	790	0903
	1240 _	0D2F
	1610 _	10FF
Ì		1446
	2340	1825
	END_	_ 1B9B

The listing:

1Ø CLEAR 45Ø

20 PMODE4,1:PCLS:SCREEN

3Ø AA\$="BRNR2HU3ER2FNUD3NGFBR"

40 AB\$="BRNR2HNGU3NHER2FGNL3FDGB

R2"

50 AC\$="BU5F2M+3,-1HL2G2D2FR3NEB

SOME OF THE PROGRAMS THAT MADE Mr. R'S THE SOFTWARE LEADER FOR THE IM-1/IM-2 ARE NOW AVAILABLE FOR THE COLOR COMPUTER, 16K, EXT BASIC. PROGRAMS LIKE

MURDER

ENTER THE MANSION AND FIND OUT WHO KILLED MRS MCDERNITT. CATCH THE CAT & SLAY THE KILLER, YOU SEE THEY ALL MOVE IN THIS CLUE TYPE THRILLER. IT'S 14.95 A CHALLENGING, REALISTIC WHO DONE IT ???

FOR EDUCATION TRY

JAIL



AN EXCELLENT TOOL TO ENHANCE SPELLING ABILITY, ALL AGES. NOT A 'HANGMAN' TYPE PROGRAM, BUT A USER CONTROLLED, 2 PROGRAM TAPE.

 CREATE YOUR OWN WORD LIST (YOU CONTROL THE DEGREE OF DIFICULTY AND AGE LEVEL),
 JAIL - YOUR LIST IS READ INTO THE PROGRAM & THE FUN/LEARNING BEGINS. ONE OR TWO PLAYERS COMPETE IN A SPELLING OR PHRASE CONTEST AND THE LOSER GOES TO JAIL. 16.95

(CREATE TAPES OF VARYING DIFICULTY FOR EACH GRADE)

2FER

GONDOLA - PILOT YOUR BALLOON OVER THE MOUNTAIN & LAND SAFELY AMONGST THE TREES. WIND, GRAVITY 1.GONDOLA & MOTHER NATURE ARE FACTORS TO CONSIDER. THIS ONE LOOKS EASY, TRY IT?

2.COPY CAT - MATCH THE COMPUTER IN THIS SIMON TYPE GAME, IF YOU CAN. 2FER 9.9.

9.95

ALL PROGRAMS ON CASSETT / WE PAY THE POSTAGE

COD (ADD \$2) COD or MONEY ORDER FOR 24 HOUR SERVICE TEL 203-644-1817

Mr. R's 68 KELLY ROAD SO WINDSOR CT 06074

R2"

60 AD\$="BU4BRD4LURFR2EU3HL3GBD4B R5"

70 AE\$="BRNR2HUENRHER2FNEBD3GBR2

8Ø AF\$="BU2NF2NRBU2ER3NRGDNLNRD2 GBR3"

96 AG\$="BU5FR4HL2G2D2FR3EUL2BD2B **R3**"

199 AH\$="EU2NR3UHBR5GD3FBR2"

AI \$= "BUURBD2NHE3UHGD2F2RBR" 110

12Ø AJ*="BUNEFREU4LNGR2BD5"

13Ø AK\$="EU3HBR5G3LBURF2DRBR"

140 AL = "BU2R2E2ULGD3GLBR2R2EBRB D"

150 AM\$="BU5FND4EFND4EFD3FBR"

ANS="BUSFND4ERFD3FBR"

AO\$="BRHU3ER2FNED3GNL2BR2" 170

AP\$="EU2UNHNUER2FDGL2HBD3BR4

19Ø AQ\$="BRNR2HU3ER2FD3GUHBD2BRD FBU2BR"

200 ARS="EU3NHER2FDGL3EF3BR"

21Ø AS\$="E4UHGDF3DL3H2BR6BD2"

22Ø AT\$="BUSFER2NRGD3GLHURBD2BR4

23Ø AU\$="BU4ED4FRENU4FBR"

AV\$="BUSFD3FREU3EBRBD5"

AWS="BUSFD3FENU4FEU3EBD5" 25Ø

AX\$="BU5RF2DF2BU5G5BR6"

27Ø AY\$="BU4ED2FRND2REU2BD5BR"

280 AZ\$="BUSFER2FGLG2FREFBR"

290 BA\$="RU2ERFDNFGLHBDBR4"

300 BB\$="RE2U3HGD4RFREUNLRBD2"

310 BC\$="RU2ERFBD2L2HBDBR3"

320 CC=="BRBU3FER2BL3BDDFREF"

330 BD\$="RU2ERFDGLHBR3U4HGDFBDBF

340 CD="BU3FERBG2NUFREU4HGDF2DF

35Ø BE\$="RE2HGF2R"

360 CE\$="BU3F2R2EHLGF2R"

37Ø BF\$="RE3UHGD6FEUHNLEBD"

38Ø BG\$="ENFUERFDGLHBR3D3GHE3BD"

39Ø CG\$="BU3R2NRGDFREUNHD4GHE3BD

400 BH\$="REJUHGDJNDBEFDR"

410 CH\$="BRBU3FEEUHGD2ND3EFD3R"

42Ø BI\$="REU2BUNEBD3DRBR"

43Ø CI\$="BU3FREBUNEBDD3RBR"

440 BJ\$="RE2UBUEBGBD2D4GHE3BD"

450 BK\$="REJUHGD4BUBER2DL2NUFR2B R"

46Ø BL\$="BRRE2U3HGD4FR"

47Ø CL\$="BU3F2EU3HGD4FR2"

48Ø BM\$="RENDUNUEFND2EFD2R"

490 CM\$="BU3FND2EFND2EFD2R"

500 BN\$="RENDUNUEFD2R"

510 CN\$="BU3FND2NUERD3R"

52Ø BO\$="BEUERFDGLHBDBR4"

53Ø CO\$="BEUERNR3FDGLHBDBR4" 540 BP="EUERFDGLHD4BU3BR3" CP\$="BRBU3FND4ERFDGLHBDBR2RB R" 560 BQ\$="BEUERFDGLHBDBR2D2FEUHNL RBDBU" 570 BR4="REU2FRD2R" 580 CR\$="BU2EFRD2R" **59**Ø BS\$="REU2F2GNHR2" BT="REU3NL2NR2NUBD3FR" 610 CTS="REU2NL2NR2NU2BD2FR" BU\$="RENU2FENU2F" 630 CU#="BENU2NDFENU2NDF" 64Ø BV="RENU2FEU2RBD3" CV#="BU3RD2FEU2RBD3" **450** 660 BW4="RENU2FENU2FEU2RBD3" 670 CW4="BRBUNU2FENU2FEU2RBD3" 680 BX = "RE3BL3F3" 690 BY = "RENU2FENU2D3GHE3BD" 700 BZ\$="BUBRUERFDGLBRD2GHE2R" 710 OM\$="BR2BUDGBEBR2"'COMMA 726 QU\$="BU3BRUERFDGBDDBR2"?? MA RK 730 DT\$="BRRBR2""PERIOD 74Ø OL\$="BU4BR2DBDDBR2BD" COLON 750 SS\$="BR5" SPACE XC\$="BUSBR2D2BD2DBR2"?! **フムの** 770 HP\$="BE2R2BRBD2" HYPHEN 78Ø UP\$="BU5BR2D2BDBF2" APOSTROP HE 790 QT\$="BU5BR2D2BRU2BD5BR2"'QUQ TF 800 A0\$="BRHU3ER2FD3GNL2BR3" 810 A1 = "BU4BR2ED5BR2" 820 A24="BU4ER2FDGL3D2R4BR2" 83Ø A3\$="BU4ER2FGNL2FDGL2NHBR6" 84Ø A4*="BR3U5G3R4BD2BR3" 850 A5="BU5NR4D2R3FDGNL3BR4" 860 A64="BUSBRNR3GD3FR2EUHL2GBD2 **BR7**" 870 A74="BU5R4D2G3BR6" 88Ø A8\$="BRNR2HUEHER2FGNL2FDGBR4 890 A94="R3EU3HL2GDFR2EBF3"

1000 NA\$="BU4R3FDHL2GDFR2ENU2FBR

1010 NB\$="BU6RD6NLBUFR2EU2HL2GBF

1030 ND\$="BRNR2HU2ER2FD2NGDU6NLB

1Ø4Ø NE\$="BRHU2ER2FDL3BD2R2NEBR3

1050 NF\$="BRU3NLNRU2ERFDBD4BR2"

1070 NH\$="NRBU6RD3ND3ER2FD3BR2"

1080 NI\$="RNRU4LBURBD5BR3"

1090 NJ\$="BDFREU5LBURBD5BR2"

1100 NK\$="RU6NLBD4R2NE2F2BR2"

1060 NG\$="BRNR2HU2ER2FNUD2NGD2GL

1020 NC\$="BRNR2HU2ER2FBD2GBR3"

2"

D6NLBR3"

2HBEBR5"

NEW! MICRO CASSETTES in convenient short lengths. MC-10 Same superior tape in premium shell MC-20 WITH LEADERS. Supplied complete with MC-30 box (fits Epson & Sharp micro drives) Call: 213/710-1430 for IMMEDIATE SHIPMENT on Credit Card Orders. MAIL TO: YORK 10[™] Computerware ORDER NOW . . . 24573 Kittridge St., #R1,Canoga Park, CA 91307 ■ ORDER FORM ■ ■ ITEM 1 DOZEN 2 DOZEN TOTAL Each std. cassette C-06 7.00 13.00 includes two YORK 10 C-12 7.50 14.00 labels only. Boxes are C-24 9.00 17.00 sold separately. We Hard Box prefer to ship by UPS 2.50 4.00 as being the fastest and Blank labels 3.00 / 100 20.00 /1000 safest. If you need ship-Storage Caddy @ \$2.95 ea. Oty ment by Parcel Post, 26.95/10 check here 120.00/50 MICRO CASS 1 DOZEN 2 DOZEN NOTE: Additional MC-10 ☐ 16.50 32.50 charges outside 48 18.00 MC-20 34.50 Continental States MC-30 19.00 36.00 Shipments to AK, HI, and USA possessions SUB TOTAL go by Priority Mail: Calif. residents add sales tax Canada & México-SHIPPING/HANDLING (any quant., except for Special) 3.50 Airmail: Outside 48 Continental States—Additional \$1 per caddy; per doz. cassettes or boxes; per 10 discs All others- Sea Mail TOTAL Check or M.O. Charge to Credit Card: VISA MASTERCARD #R1 ☐ PLEASE SEND QUANTITY DISCOUNTS Card No. _ Exp. . Name Address City .. State/Zip _ Signature : Phone Computer make & model

LOWER PRICES

LONGER LENGTHS

STORAGE CADDY

cassettes w/o boxes

Includes edge labels

TRACTOR FEED

DIE-CUT BLANK

CASSETTE LABELS

and Index card

Holds 12

DATA TRAC C-06, C-12, C-24

38¢ each

From the leading supplier of Computer

Grade Cassettes, new, longer length C-12's

(6 minutes per side) provide the extra few

feet needed for some 16K programs.

Premium 5-screw shell with leader

Internationally acclaimed.

Thousands of repeat users.

Error Free • Money back Guarantee

Shipping \$17.00/500

w/labels add 4¢ w/boxes add 13¢

51/4" Single Side. Double Density, Soft-Sectored.

BASF Qualimetric Flexi-Disc-Lifetime Warranty.

—BASF tape

SPECIAL 500 C-12's

1110 NL\$="BU6RD6NLRBR2" 1120 NM\$="BU4FND3EFND3EFD3BR2" 1130 NN\$="BU4FND3ERFD3BR2" 1140 NO\$="BRHU2ER2FD2GNL2BR3" 1150 NP\$="BU4FND2ER2FD2GL2HD3LBU 2BR7" 1160 NQ4="BRNR2HU2ER2FNED2NGD3RB U2BR2" 1170 NR\$="BRBU4FND3ERFBD3BR2" 1180 NS\$="BUFR2EHL2HER2FBD3BR2" 119Ø NT\$="BU4RNUNRD3FREBDBR3" 1200 NU\$="BUNU3FR2ENU3FBR2" 121Ø NV\$="BU2NU2F2E2NU2BD2BR2" 1220 NW4="BUNU3FENU3FENU3BR2BD" 123Ø NX\$="E2NH2NE2F2BR2" 1249 NY\$="BUNU3FR2ENU3D2GL2HBUBR 125Ø NZ\$="BU4R4G4R4BR2" 126Ø SS\$="BR5" 127Ø XM\$="NUNGBR2" 128Ø DT\$="BR2R" 129Ø XC\$="UBUU3BD4BR2" 1300 QM\$="BU5ER2FDGLDBDDBR4" 1310 KA\$="U5ER2FD3NL4D2BR3" 1320 KB\$="U6R3FDGNL3FDGNL3BR5" 1330 KC\$="NRHU4ER2FBD4GNL2BR4" 1340 KD\$="U6R3FD4GNL3BR4"

PEACOCK ENTERPRISES

1350 KE\$="NR4U3NR3U3R4BD6BR3"

1370 KG\$="BRHU4ER2FBD3NLDGNL2BR4

136Ø KF\$="U3NR3U3R4BD6BR3"

WE'RE PROUD

CMAILIST IS A GREAT ADVENTURE -BUT NOT AN ADVENTURE GAME!

An Address Book, Phone Book, Mail Label Generator and a whole lot more.

CMAILIST is a powerful and professional MINI-DATA-BASE for home or office use. CREATE, ADD, DELETE, CHANGE, INSPECT, SEARCH, SORT, MAILING LABELS, TICKER FILE, and INVOICE all so easily, you'll wonder why you waited so long!

Up to 500 RECORDS containing 10 FIELDS can be stored per file (memory and system dependent).

CMAILIST is available in the following versions:

4.0 Cassette Systems (specify 16K or 32K) \$19.95 5.0 Disk Systems \$24.95 5.1 2 Drive Disk Systems with INVOICing \$29.95

CMAILIST includes an easy to follow Comprehensive Manual & 1 year warranty.

SO JOIN THE GREATEST ADVENTURE OF ALL-YOU WILL BE A WINNER!

C.ITOH ProWriters \$465 Parallel \$565 serial

SEND FOR FREE CATALOG!

Prices Include Shipping! COD Accepted on Software only! Send check or money orders to:

PEACOCK ENT. 194 CANNONGATE III ROAD NASHUA, NH 03063 603-880-8169 Mon-Sat 10-10 1386 KH4="U3NU3R4NU3D3BR3" 1390 KI\$="NU6BR3" 1400 KJ = "BUNUFRZENUSBDBR3" 1410 KK+="U3NU3R2E2UBD3BL2F2DBR3 1420 KL\$="NU6R4BR3" 1430 KM\$="U6F3E3D6BR3" 1449 KN\$="U5NUF4NU5DBR3" 1450 KO\$="BRNR2HU4ER2FD4GBR4" 1460 KP4="U6R3FDGNL3BF3BR" 147Ø KQ\$="BRHU4ER2FD4GLNUNDNLBR5 1480 KR\$="U6R3FDGL2NLF3BR3" 149Ø KS\$="BUFR2EUHL2HUER2FBD5BR3 1500 KT\$="BR2U6NL2R2BD6BR3" 151Ø KU\$="BRHU5BR4D5GNL2BR5" 1520 KV\$="BR2H2U4BR4D4G2BR5" 153Ø KW4="BUNU5FE2F2ENU5BR3BD" 154Ø KX\$="UE2H2UBR4DG2F2DBR3" 155Ø KY\$="BR2U3H2UBR4DG2BF3BR2" 1560 KZ\$="NR4UE4UNL4BF3BD3" 1570 K1 = "BRU6NGBD6BR3" 158Ø K2*="BU6R3FD2GL3D2R4BR3" 159Ø K34="BU6R3FDGNL2FDGNL3BR4" 1600 K4\$="BU6D4R3NU4NRD2BR4" 1610 K5\$="R3EU2HL3U2R4BD6BR3" 1620 K64="BUNUFR2EUHL2GU3ER2FBD5 BR3" 163Ø K7\$="BU6R4D3GD2BR4" 164Ø K8="BRHUEHUER2FDGNL2FDGNL2 BR4" 1650 K94="BUFR2EU4HL2GDFR2EBD4BR 1660 KØ\$=KO\$ 167Ø HF\$="BU2R2BD2BR2" 1990 ' 2000 DRAW "S8BM20,20"+AW\$+BH\$+BA \$+CT\$+SS\$+BI\$+BS\$+SS\$+BY\$+CO\$+CU \$+BR\$ 2005 DRAW SS\$+BN\$+BA\$+BM\$+BE\$+QU 2010 DRAW "S8BM15,40"+KW\$+NH\$+NA \$+NT\$+SS\$+NI\$+NS\$+SS\$+NY\$+ND\$+NU \$+NR\$+55\$ 2015 DRAW NN\$+NA\$+NM\$+NE\$+QM\$ 2020 DRAW "BM20,60"+AM\$+BY\$+SS\$+ BN\$+BA\$+BM\$+BE\$+SS\$+BI\$+BS\$+SS\$ 2025 DRAW AC\$+CH\$+BE\$+BR\$+BY\$+CL \$+\$\$\$+BA\$+BN\$+BD\$+\$\$\$ 2030 DRAW "BM5,80"+BH\$+BI\$+BS\$+S S\$+BN\$+BA\$+BM\$+BE\$+SS\$ 2035 DRAW BI\$+BS\$+SS\$+AS\$+BT\$+BE \$+BV\$+BE\$+DT\$ 2040 DRAW "BM15,100"+KM\$+NY\$+SS\$ +NN\$+NA\$+NM\$+NE\$+88\$+NI\$+N8\$+88\$ 2045 DRAW KC\$+NH\$+NE\$+NR\$+NY\$+NL

2050 DRAW "BM5,120"+NA\$+NN\$+ND\$+

Introducing . . .

New! From the Programmer's Guild

NINJA WARRIOR... The Ultimate Arcade Challenge!

New from Arcade Master Charles Forsythe!
The most original game ever produced!
16 levels of breath taking action!
Up to 6 players in competition!
Keyboard or joystick control.
Runs on any 16K TRS-80 color or TDP 100.
Guide your Ninja through boulders, fire, pitfalls,flaming meteors, and Ninja masters to attain the ultimate achievement in — NINJA GRANDMASTER!



NINJA WARRIOR

m is the single most difficult arcade game ever written!

Exciting—Frustrating—Difficult—Impossible — your skill will tell the tale.

NINJA WARRIOR — for those who would face the ultimate arcade challenge—

TO WIN OR DIE!

\$29.95 cassette Free Shipping VISA MASTERCARD

THE PROGRAMMER'S GUILD
P.O. BOX 66
PETERBOROUGH, NH 03458
or Call (603) 924-6065 for COD—

AND GET "FREE" SHIPPING ANYWHERE ON THE PLANET EARTH OR HER COLONIES

98\$+NH\$+NI\$+NS\$+99\$+NN\$+NA\$+NM\$+ NE\$+55\$ 2055 DRAW NI\$+NS\$+SS\$ 2060 DRAW "BM5,140"+K8\$+NT\$+NE\$+ NV++NE++DT+ 2070 DRAW "BM5,160"+BC\$+BA\$+BT\$+ SS\$+SS\$+NC\$+NA\$+NT\$+SS\$+SS\$ 2075 DRAW BD\$+BO\$+BG\$+SS\$+SS\$+ND \$+NO\$+NG\$ 2080 DRAW "BM5,180"+A2\$+DT\$+SS\$+ AD\$+BA\$+BD\$+SS\$+KD\$+NA\$+ND\$+SS\$ 2085 DRAW K2\$+DT\$+SS\$+AM\$+CO\$+CM \$+55\$+KM\$+NO\$+NM\$:GOSUB 3020 2170 DRAW "BM5, 20"+A3\$+SS\$+AP\$+B A\$+BU\$+CL\$ 2180 DRAW "BM 120,20"+K3\$+SS\$+KP \$+NA\$+NU\$+NL\$ 2190 DRAW"BM5,40"+A44+SS\$+AA\$+BR \$+BT\$+BH\$+BU\$+BR\$ 2200 DRAW"BM120.40"+K4\$+8S\$+KA\$+ NR\$+NT\$+NH\$+NU\$+NR\$ 2210 DRAW "BM5.60"+A5\$+SS\$+AF\$+B R\$+BA\$+BN\$+BK\$ 2220 DRAW "BM120.60"+K5\$+SS\$+KF\$ +NR\$+NA\$+NN\$+NK\$ 2230 DRAW "BM5,80"+A6\$+88\$+AN\$+B A\$+BN\$+BC\$+BY\$ 224Ø DRAW "BM12Ø,8Ø"+K6\$+SS\$+KN\$ +NA\$+NN\$+NC\$+NY\$

Shifter



A talking "munch game" for 1 or 2 simultaneous players. Developed by MIT grad in machine language for incredible performance—at fastest speed, you can cross the screen in about 1 second. Shifting maze adds surprises. Players greet each other when meeting. Can select computer as opponent for 1 player.

\$20.

Articulator I

Add speech to your programs or change dialog in **Shifter.** Digitizes your voice from audio tape; sound track may be put on tape as part of other programs. Comes with Basic callable interface.

\$20.

Both available on cassette for 16 or 32K.Ext. Basic not required. Sticks required for Shifter.

29 ENTERPRISES
1208 Country Ct. Cary, NC 27511

225Ø DRAW "BM5.100"+A7\$+SS\$+AS\$+ BU\$+BS\$+BA\$+BN\$ 2260 DRAW "BM120,100"+K7\$+SS\$+KS \$+NU\$+NS\$+NA\$+NN\$ 2270 DRAW "BM5,120"+A8\$+55\$+AH\$+ BE\$+BN\$+BR\$+BY\$ 2280 DRAW "BM120,120"+K8\$+SS\$+KH \$+NE\$+NN\$+NR\$+NY\$ 2290 DRAW "BM5,140"+A9\$+SS\$+AB\$+ BE\$+BT\$+BT\$+BY\$ 2300 DRAW "BM120,140"+K9\$+SS\$+KB \$+NE\$+NT\$+NT\$+NY\$ 231Ø DRAW "BMØ, 160"+A1\$+A0\$+SS\$+ AG\$+BE\$+BO\$+CR\$+BG\$+BE\$ 232Ø DRAW "BM112,16Ø"+K1\$+KØ\$+SS \$+KG\$+NE\$+NO\$+NR\$+NG\$+NE\$ 2330 DRAW "BMØ,180"+A1\$+A1\$+SS\$+ "BR2"+AD\$+BA\$+BV\$+BI\$+BD\$ 234Ø DRAW "BM12Ø,18Ø"+K1\$+K1\$+SS \$+KD\$+NA\$+NV\$+NI\$+ND\$:GOSUB 3020 2350 DRAW "BM15,20"+AT\$+BH\$+BE\$+ 88\$+BQ\$+BU\$+BI\$+BC\$+BK\$+89\$ 2355 DRAW BB\$+BR\$+CO\$+CW\$+CN\$+SS \$+BF\$+CO\$+BX\$+SS\$ 2370 DRAW "BM5,40"+BJ\$+BU\$+BM\$+B P\$+BS\$+SS\$+CO\$+CV\$+BE\$+BR\$+SS\$ 2375 DRAW CT\$+CH\$+BE\$+SS\$+BL\$+BA \$+BZ\$+BY\$+SS\$+BD\$+CO\$+CG\$+DT\$ 239Ø DRAW "BM15.60"+KT\$+NH\$+NE\$+ SS\$+NQ\$+NU\$+NI\$+NC\$+NK\$+SS\$+NB\$+ 2395 DRAW NO\$+NW\$+NN\$+55\$+NF\$+NO **\$+NX\$** 2410 DRAW "BM5,80"+NJ\$+NU\$+NM\$+N P\$+NS\$+SS\$+NO\$+NV\$+NE\$+NR\$+SS\$ 2415 DRAW NT\$+NH\$+NE\$+SS\$+NL\$+NA \$+NZ\$+NY\$ 243Ø DRAW "BM5.1ØØ"+ND\$+NO\$+NG\$+ DT\$ 244Ø DRAW "54BM15,12Ø"+KT\$+NH\$+N E\$+59\$+NQ\$+NU\$+NI\$+NC\$+NK\$+55\$ 2445 DRAW "R2Ø"+SS\$+NF\$+NO\$+NX\$+ 2447 DRAW SS\$+NO\$+NV\$+NE\$+NR\$+SS \$+NT\$+NH\$+NE\$+SS\$+"R16" 2470 DRAW"BM5,130"+ SS\$+ND\$+ND\$+ NG\$+DT\$ 2480 DRAW "BM25,150"+K1\$+DT\$+SS\$ +NR\$+NE\$+ND\$+55\$+K2\$+DT\$+68\$ 2485 DRAW NL\$+NA\$+NZ\$+NY\$+88\$+K3 \$+DT\$+SS\$+NB\$+NR\$+ND\$+NW\$+NN\$ 2487 DRAW SS\$+K4\$+DT\$+SS\$+NS\$+NM \$+NA\$+NL\$+NL\$:GOTO 3010 3000 GOTO 1990 3Ø1Ø GOTO 3Ø1Ø 3020 A\$=INKEY\$ 3030 IF A\$="G" THEN GOTO 3040 EL SE GOTO 3020 3Ø4Ø PCLS:RETURN

One Stop Shopping For The Color Computer.

CONSOLINK° MicroSpooler





FROM:

\$199⁰⁰

MC-10 SPELLER \$ 9.95
MC-10 TYPER \$12.95
MC-10 MATH I \$ 9.95
PHONE MINDER \$ 6.95
MC-10 CASSETTE LABELER \$ 9.95
COLOR COMPUTER CASSETTE
LABELER \$10.95

8 SEC.

lengths, 40 char/line. Assumes CPU can output text at a minimum of 5,800 char./sec. with a 64K buffer.

60 lines per page, random line

STOCKING DEALER FOR:

Aardvark Ltd. Amdek Corp. · Bear Bones Botek

Cognitec
Color Quest

CompuServe Computer Island

Computerware

Consolink

Creative Computers
Custom Software

Data Soft Inc.

DSL

Eigen Systems
Eighty Computer

Interstate Tech.

Intracolor

K-2 Electronics Leading Edge M & S Software Magnazine

Mark Data Products

Med Systems
Micro Products
Micro Tech
Micronix
Monarch Press

Moreton Bay Mortorola

Nanos Systems Nelson Software

Osborne/McGraw Hill

Peterson Dist.

Petrocci FreeLance

Platinum

Prentice-Hall Prickly-Pear Radio Shack

Rainbow Connection
Reitz Electronics, Inc.
Renaissance Game Designs

Southern Software Spectral Associates Spectrum Products Star Micronics Inc. Sugar Software Superior Software

TDP

Toledo Appliance Tom Mix Software

Trans Tek U.S. Robotics York 10

PLUS MANY OTHERS!!!

- DEALER INQUIRIES INVITED -

Please include phone number with all orders. Also add \$5.00 S/H for all printer and computer orders \$2.00 for all software orders. Ohio residents please add 6% state sales tax.

1-800-242-COCO (OUTSIDE OHIO)

1-800-247-COCO (IN OHIO)

DISCOVER THE WORLD OF COMPUTING WITH



3170 W. Central Avenue Westgate Meadows Shopping Center Toledo, OH 43606 PHONE (419) 537-1432 (In Ohio) Cleveland Area call (216) 273-4600 11 a.m. to 9 p.m. EST





FINALLY!

A REAL SPREAD-SHEET PROGRAM FOR THE COLOR COMPUTER

DYNACALC

Business people use spread-sheets to organize columns and rows of figures. DYNACALC simulates the operation of a spread-sheet without the mess of paper and pencil. Of course, corrections and changes are a snap. Changing any entered value causes the whole spread-sheet to be re-calculated based on the new constants. This means that you can play, 'what if?' to your heart's content.

But DYNACALC isn't just for accountants. DYNACALC can be used for just about any type of job. Not only numbers, but alphanumeric messages can be handled. Engineers and other technical users will love DYNACALC's sixteen-digit math and built-in scientific functions. There's even a built-in sort command, so you can use DYNACALC to manage small data bases - up to 256 records.

DYNACALC will let your computer do just about anything you can imagine. Ask your friends who have VisiCalc, or a similar program, just how useful an electronic spread-sheet program can be for all types of household, business, engineering, and scientific applications.

DYNACALC is designed to be used by non-programmers, but even a Ph.D. in Computer Science can understand it. Built-in HELP messages are provided for quick reference to operating instructions.

DYNACALC has a beautifully simple method of reading and writing FLEX data files, so you can communicate both ways with other programs on your system, such as the Text Editor, Text Processor, Sort/Merge, RMS data base system, or other programs written in BASIC, C, PASCAL, FORTRAN, and so on.

Except for a few seldom-used commands, DYNACALC is memory-resident, so there is little disk I/O to slow things down. The whole data array (worksheet) is in memory, so access to any point is instantaneous. DYNACALC is 100% 6809 machine code for blistering speed.

Color Computer DYNACALC works with the FLEX operating system from Frank Hogg Laboratory (64k required). If you aren't already using this powerful operating system, we have a special deal for you: order DYNACALC (regularly \$200) and FHL Color FLEX (regularly \$99) together for only \$250.

To order, see your local DYNACALC dealer, or order directly from CSC at the address below. We accept telephone orders from 10 am to 6 pm, Monday through Friday. Call us at 314-576-5020. Your VISA or MasterCard is welcome. Be sure to specify that you want the Color Computer version.

ORDER YOUR DYNACALC TODAY!

Computer Systems Center 13461 Olive Blvd. Chesterfield, MO 63017 (314) 576-5020





Peeking Into The Hidden Commands Of The MC-10

By Tom Szlucha

t first glance, the MicroColor Computer (MIC) recently introduced by Radio Shack appears to be well-suited for beginning programmers, but may turn away many advanced programmers because it lacks several commands needed to manipulate machine code. After some detailed examination into the BASIC interpreter, I have found that this is not entirely true. Besides the 68 documented commands and functions, there are at least five undocumented commands that, with some study, should allow an unleashing of the machine language capabilities of this Micro-box.

Tandy has built several undocumented commands into MIC apparently for use with cassette-based software. These commands support various machine language functions which should allow them to market more sophisticated software than is allowed with BASIC. The quest for these "hidden" commands came from knowing that Radio Shack has a reputation for not always disclosing everything that they know (or should know) about the operation of their machines. It was also driven by a desire to understand some of the differences between the BASIC used in MIC and that used in the CoCo.

There are several techniques which can be used to establish the existence of hidden commands. One of these techniques is somewhat hit and miss but can be effective. Suspected commands are typed into the computer and the subsequent response is studied. For example, examine Table 1 which contains MIC's response to several commands.

Table 1 — Response to Various Keyboard Input

Command	Response	Comment
NEW	OK prompt	known command
LIST	OK prompt	known command
XYZ	syntax error	known garbage
EXEC	FC error	suspected command
CLOADM	S (searching tape)	suspected command
CLOADZ	TM error	verification

in a syntax error. *EXEC* gives an FC error rather than syntax error indicating that MIC recognizes the existence of the command but needs more information to process it. The response to *CLOADM* is a familiar S in the upper lefthand corner of the screen as BASIC waits for a program to appear at the cassette port. If *CLOAD* were typed instead of

Typing NEW and LIST give the expected OK prompt, and XYZ is clearly recognized as a non-command resulting

CLOADM, the response would be the same, but note the response to CLOADZ, a TM error occurs. This indicates BASIC treats the "M" with special respect. In fact, BASIC only likes to see an M, space or quote after CLOAD.

With several hundred commands used in the various dialects of TRS-80 language, not including countless possible new variations, the trial and error method of searching is obviously limited. Another technique which can be used to discover "new" commands is to examine the BASIC Command Table. The Command Table is a list of key words used by the computer to distinguish commands and functions from variable names. MIC's BASIC directory is located in memory location 57413 to 57670 (decimal). The short program (Listing 1) shown below can be used to "peek" at this list of commands.

Listing 1 — Peeking At MIC's Command Table

- 10 FOR A=57413 TO 57670
- 20 P=PEEK(A)
- 30 IF P>127 THEN LPRINT CHR\$(P-128),:LPRINT A:GOTO 50
- 40 LPRINT CHR\$(P);
- 50 NEXT A

This program prints a list of the commands and functions recognized by BASIC along with the address of the last character in each command. These commands are stored in memory using the ASCII code for each letter with 128 added to the last character of each command to indicate to the computer that it is the end of a word. Undocumented commands: EXEC, CLOADM, USR, VARPTR, and OFF. Of these, three have been determined to work, the other two will have to await further detective work.

The hidden commands work essentially like their CoCo counterparts. The following is a brief description of each.

CLOADM "filename", S, E, T — Loads a machine language program named "filename." S is the address to start loading the code, E the ending address, and T, the transfer address; all of these are in decimal

EXEC X Executes a machine language program. If the program was previously loaded with CLOAD-M, X, the transfer address is handled automatically

VARPTR This is a function used to determine the address where a specific variable is stored. It also can be used to determine the size of a string variable. This is a very powerful command, allowing string packing for fast animation and allows

fast sorting routines—a real gem to have on MIC. See Ron Mummaw's recent article "VARPTR—BASIC'S Hidden Command" in the June 1983 issue of the Rainbow.

The fourth command, USR, more than likely works in Color BASIC, but the address which holds the location of the user-supplied subroutine has eluded detection. Until this location can be found, EXEC can be used in many instances as a substitute. The fifth command, OFF, is in the key word table and is recognized by the computer, but there is nothing to turn off. In Color BASIC, OFF works with MOTOR and AUDIO, but these are not present as functions on the MC-10. It could be that this command is either a leftover or is present for a future enhancement. A call to Tandy's technical hotline was of little use in obtaining more detail on these commands. It appeared that they were learning about these hidden commands for the first time from the phone inquiry. Their response as expected was that the commands were for "future applications" and they were not aware of any further intended documentation.

It is certainly exciting to discover this hidden power in the MC-10, but somewhat disappointing that a CSAVEM command was not also discovered. The lack of a machine language save feature appears to be the only major stumbling block to writing machine code on this computer. To test the EXEC and CLOADM commands, I resorted to writing a short test program on the CoCo, saving it to tape, then inputting it to MIC. Once a commented disassembly of the BASIC ROM is available, a save routine can be developed. Also, it may be possible to trick the machine into saving machine code by changing the BASIC pointers. Looks like more detective work ahead.

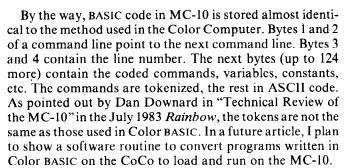
> KALEIDOSCOPIC CREATIONS **PRESENTS**

SCRAMBLE°

AN AMAZING NEW WORD GAME FOR 2 TO 4 PLAYERS THAT CHALLENGES THE INTELLECT. WILL YOU HAVE THE "SMARTS" TO UNSCRAMBLE THE MESS? FOUR DIFFICULTY LEVELS. **FUN FOR ALL AGES.** GREAT AT PARTIES. 16K NON-EXT. TAPE SEND \$15.95 (DELIVERY INCL.) TO

> KALEIDOSCOPIC CREATIONS P.O. BOX 1284





In a related topic, I have noticed that the MC-10 seems to run BASIC faster than the Color Computer. To verify this, I ran the simple Benchmark program shown in Listing 2 to compare them.

Listing 2 — Timing Program

10 FOR I=1 TO 1000

20 PRINT I

30 NEXT I

Sure enough, the MC-10 took 17.5 seconds, whereas the CoCo took 20.7 seconds. It takes the speed-up *POKE* for the CoCo to beat its little brother (13.9 seconds). Since the BASIC clock speed is the same for the two computers at .895 mhz, I attribute the faster execution speed to more efficient interpreter code in the MC-10.

(I would like to acknowledge the technical contributions of my 15-year-old son, David Szlucha and his 16-year-old collaborator, Dean Swain. These microteens made many of the discoveries discussed in this article within hours of unpacking our new MC-10.)

wild party

A naughty, sexy computer game for 2 to 6 couples. Game varies every time you play. All prompts from TV screen, no need to read complicated instructions. Send self-addressed stamped envelope for program descrip-

tion and instruction sheet.

On cassette tape. For 16K Color Computer. Extended BASIC not required.

\$35.00 incl postage. (PA resid add \$2.10) Send check to P.O. Box 210, Jenkintown, PA 19046

software



MC-10 vs. CoCo A Command Summary

By Frank Smith

Thile poking around inside my PoCo I made some interesting discoveries. One thing I noticed was that Microsoft managed to pack plenty of power in that 8K ROM. I kept running into so many commands which belonged to Extended BASIC on the CoCo that I decided to make a comparison chart between both levels of BASIC on the CoCo and Micro Color BASIC. The Extended BASIC commands are marked with a #. The only real disappointments are the lack of EDIT and ELSE.

Radio Shack has made provision for an easy upgrade to 20K by using a socket which can hold a 16K RAM module (Cat. No. 26-3013, \$49.95).

As mentioned by Thomas Szlucha in articles last month and this month, there are some BASIC words which are not mentioned in the documentation that comes with the PoCo. Could there be more?

CoCo Functions	MC-10 Functions
ABS(numeric)	ABS(x)
ASC(str)	ASC(str)
# ATN(numeric)	#***
CHR\$(code)	CHR\$(c)
# COS(numeric)	COS(numeric)
EOF(f)	****
# EXP(numeric)	EXP(numeric)
# FIX(numeric)	****
# HEX\$	****
INKEY\$	INKEYS
INT(numeric)	INT(x)
JOYSTK(j)	****
LEFT\$(str,length)	LEFT\$(str,c)
LEN(str)	LEN(str)
LOG(numeric)	LOG(numeric)
MEM	MEM
MID\$(str,pos,length)	MID\$(string,pos,len)
PEEK(location)	PEEK(n)
POINT(x,y)	POINT(x,y)
# POS(device)	****

CoCo Functions	MC-10 Functions
# PPOINT(x,y)	****
RIGHT\$(str,c)	RIGHTS(str,length)
RND(n)	RND(n)
SGN(x)	SGN(x)
SIN(numeric)	SIN(numeric)
# STRING\$(length,code)	****
STR\$(numeric)	STR\$(x)
# SQR(numeric)	SQR(numeric)
# TAN(numeric)	TAN(numerie)
# TIMER	****
#_USR(x)	>>USR(x)<<
VAL(str)	VAL(str)
VARPTR(var)	>>VARPTR(var)<<

CoCo Statements	MC-10 Statements	
AUDIOON / AUDIOOFF	***	
# CIRCLE(x,y)r,c,hw,s,e	****	
CLEAR n,h	CLEAR n % CLEAR n,h	
CLOAD	CLOAD	
CLOADM	****	
***	CLOAD*	
CLOSE d	****	
CLS c	CLS(e)	
# COLOR(foregnd,backgnd)	****	
CONT	CONT	
CSAVE	CSAVE	
****	CSAVE*	
DATA	DATA	
# DEF FN	****	
# DEFUSR n	****	
DEL	****	
DIM	DIM	
# DLOAD	****	
# DRAW	****	
# EDIT	****	
END	END	

CoCo Statements	MC-10 Statements	
EXEC a	>>EXEC a<<	
FORTOSTEP/NEXT	FORTOSTEP/NEXT	
# GET(start)-(end),des,G	****	
GOSUB	GOSUB	
СОТО	GOTO	
IFtestTHENELSE	1FTHEN ****	
INPUT	INPUT	
INPUT#-1	****	
# INSTR (pos,search,target)	****	
# LET	LET as through the slate of the County	
LIST	LIST	
LLIST	LLIST	
***	LPRINT	
# LINE(x1,y1)-(x2,y2),BF	****	
# LINE INPUT	agen ****	
MOTORON / MOTOROFF	70**** Single 10 10 10 10 10 10 10 10 10 10 10 10 10	
NEW	NEW	
ONGOSUB	ONGOSUB	
ONGOTO	ONGOTO	
OPEN m,#d,f	**** design	
# PAINT (x,y),c,b	****	
# PCLEAR n	****	
# PCLS	****	
# PCOPY	****	
# PLAY	****	

CoCo Statements	MC-10 Statements	
# PMODE mode,start-page	****	
POKE (location,value)	POKE	
# PRESET	Aug. ****	
PRINT	PRINT	
PRINT@n	PRINT@n	
PRINT#-1	****	
PRINT#-2	****	
PRINTTAB	PRINTIAB	
# PRINT USING	***	
# PSET (x,y,c)	marries **** Selection of the control of the contro	
# PUT (start)-(end),scre,act	****	
READ	READ	
REM	REM	
# RENUM	***	
RESET (x,y)	RESET(x.y)	
RESTORE	RESTORE	
RETURN	RETURN	
RUN	RETURN	
# SCREEN screen-type,clrset	****	
SET (x,y,c)	SET(x,y,c)	
SKIPF	SKIPF	
SOUND tone, duration	SOUND(f,d)	
STOP	STOP	
# TROFF	****	
# TRON	****	

COMPUKIDS MAGAZINE

The Computer Magazine for Beginners

Educational articles that are easy to understand Game programs

Computer book reviews

Program problems

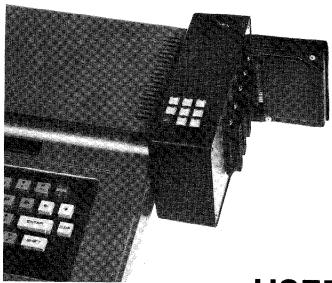
CompuKids Club

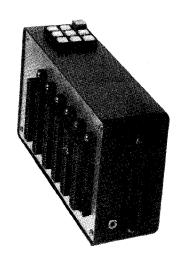
1 year magazine subscription Contests with GREAT prizes Free computer advice Program exchange Educational programs

Mail Ch	eck or Money Order to: bulkids Magazine RB		Or Phone TOLL FREE: 1-800-822-KIDS	
		•	State	
	Age			
	Payment enclosed (check or money order)			
	One year subscription only —\$ Six month trial subscription —	•		
	One year subscription plus on (Canada — \$31.00)	e year membership in	and lots more CompuKids Club — \$24.00	

P.O. Box 874 Sedalia, MO 65301

EXPAND YOUR COLOR COMPUTER





USER 80C

USER SELECTABLE EXPANSION REQUIREMENTS

- •Activate your disk controller, ROM CARTRIDGES, EPROM board, or any device that normally operates in the expansion slot.
- •Protects computer from electrical damage caused by experimental boards or by plugging/unplugging ROM CARTRIDGES and controllers with the power on.
- •Gold inlay connector contacts for more reliable operation.

 Menu-driven software (included). Allows user to operate multiple slots at the same time. (e.g., transfer data from one slot to any other slot).
- •Select any of 6 slots with push-button keys or programming.
- •Attach additional USER 80C's for more expansion slots.
- •Utilizes its own reset button, eliminating the need to continually press the reset behind the computer.
- •Operates with a 9V battery eliminator (included). Power supply is independent of computer.
- •Has its own on/off switch with LED indicator.
- More to come: analog digital converter, parallel ports for printers and joysticks, four-channel scope.
- •Production of experimental boards upon request. (Based on your schematics).

"Designed with the User in Mind" \$249.95

TERMS: Send certified check or money order for \$249.95, plus shipping, handling and applicable sales tax. (Personal checks take three weeks to process.) For shipping and handling include \$5.00 U.S., \$8.00 Canadian/Mexican, \$15 Overseas. Illinois residents include 5% Sales Tax. Prompt shipment. Dealer/Club inquiries invited.



J-NOR INDUSTRIES, INC.

6272 W. North Avenue Chicago, IL 60639 Phones (312) 745-7541 (312) 622-4555

Guaranteed for one full year (parts and labor)

Lower Case Interpreter **Could Be Time Saver**

Wish you were able to type program listings in lowercase mode instead of having to toggle back and forth between lower- and uppercase with the CoCo's cumbersome Shift-0? Wish no more. The folks at JARB Software have come up with a nice, short machine language program that allows you to type in lowercase mode not only the messages within quotes that you want in lowercase, but also the BASIC commands that otherwise require an uppercase input.

LCINT, which stands for Lower Case Interpreter, is a short machine language on tape that loads in less time than what it takes to insert the cassette in the tape recorder. Two versions of the program are included on each side of the tape, LCINT16 and LCINT32, for a 16K...Oh, but you've guessed what the two versions are for. Once you've loaded the appropriate version on your machine, you type in EXEC. Nothing noticeable happens just yet. But press Shift-0 and type the following line:

10 print "Show us your lower case!" Now *LIST* it. The line now appears as 10 PRINT "Show us your lower case!"

and when you RUN the program your message appears just as you typed it, with reverse video characters indicating lowercase, unless, of course, you have installed one of the lowercase boards on the market. And, if you have a printer, true upper- and lowercase would be displayed. The important thing, however, is that the lowercase BASIC command print was accepted as typed, permitting easier input.

LINCT also provides a single key PAUSE function, implemented with the CLEAR key, which would not only perform the same functions as SHIFT@, but gives you the convenience of single step through program listings or through disk directories, leaving the normal functions of the CLEAR key untouched when not listing a program or a directory.

If you have a need for printing messages in upper- and lowercase in your BASIC programs, this machine language utility can be a timesaver. The program performs as advertised. The 16K version resides in memory locations &H3F60 through &H3FFA, and the 32K version resides between memory locations &H7F60 and &H7FDF. The program comes on cassette tape, but is disk compatible. Although the documentation consists of a single sheet, it proves adequate for this simple application program.

(JARB Software, 1636 D Avenue, Suite C, National City, CA 92050, \$10.95)

-Dr. Carlos Calle

The Original FLEX™ for Color Computers

- * Upgrade to 64K
- * RS to FLEX. FLEX to RS file transfer ability
- * Create your own character set
- * Automatic recognition of single or double density and single or doubled sided
- All features available for either single or multiple drive systems
- * Settable Disk Drive Seek Rates
- * Faster High Resolution Video Display with 5 different formats
- Save RS Basic from RAM to Disk
- Move RS Basic to RAM
- * Load and save function on FLEX disk
- 24 Support Commands 12 with Source Text
- External Terminal Program

Languages Available

Pascal, Fortran, RS Basic, RS Assembler, TSC Basic, TSC Assembler, Relocating Assembler, Macro Assembler, Mumps

If you are tired of playing games on your TRS-80C. Color Computer, or find that you are handicapped by the limitations of the RS BASIC in trying to write a Program that will allow you to actually USE the Color Computer as a COMPUTER, YOU ARE READY TO MOVE UP TO THE FLEX9. Operating System. If you want to have REAL PROGRAMMING POWER using an Extremely Powerful Business BASIC. PASCALs, C Compilers, a full-blown Macro Assembler with a Library capability so you are not continuously reinventing the wheel. YOU ARE READY TO MOVE UP TO THE FLEX9. Operating System. If you would like to see if YOU REALLY COULD USE A COMPUTER IN YOUR BUSINESS, or begin to make your Computer state. PAYING IT'S OWN WAY by doing some Computer Work for the millions of small businesses around you, such as Wordprocessing. Payroll, Accounting, Inventory, etc., then YOU ARE READY TO MOVE UP TO THE FLEX9.

DATA-COMP's FLEX9 Conversion for the TBS-80C Color Computer was designed for the DATA-COMP's FLEX9 Conversion for the TRS-80C Color Computer was designed for the SERIOUS COMPUTER USER: with features like greatly increased Display Screens. WITH Lower Case Letters, so you can put a FULL Monu on ONE Screen, or see SEVERAL Paragraphs at the same time: with features like providing a FULL Keyboard so you have FULC control of your Computer AND it's Programs NATURALLY, without needing a chart to see what Key Combination will give you what function, with USER OHIENTED functions to make using the Operating System natural, like having the Computer AUTOMATICALLY determine what type of Disk is being used in what type of Disk Drive and working accordingly, rather that you have to specify each and every thing for it, or like having the Computer work with the Printer you have been using all along without you having to tell the new Operating System what is there etc.

*FLEX is a trademark of Technical Systems Consultants

DATA-COMP has everything you need to make your TRS-80C " Color Computer WORK for YOU; from Parts and Pieces to Full, Ready To Use SYSTEMS. DATA-COMP designs, services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK FOR YOU!

System Requirements

FLEX9 Special General Version x Editor & Assembler (which normally sell for \$50.00 \$150.00 F-MATE(RS) FLEX9 Conversion Rout, for the RS Disk Controller when purchased with Special General FLEX9 Sys.

Set of Eight 64K RAM Chips w Mod. Instructions \$49.95 \$59.95 \$59.95 Color Computer with 64K RAM and EXT. BASIC

SPECIAL SYSTEM PACKAGES

64K Radio Shack COLOR COMPUTER. Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9 . F-MATE(RS) " and a Box of 10 Double Density Diskettes; a COMPLETE, ready to run SYSTEM on your Color TV Set. \$1079.95

DISK DRIVE PACKAGES, etc.

These Packages include the Radio Shack Disk Controller. Disk Drives with Power Supply and Cabinet. and Disk Drive Cable:

PAK #1 — 1 Single Sided. Double Density Sys.

\$489.95

PAK #2 — 2 Single Sided. Double Density Sys.

\$749.95

PAK #3 — 1 Double Sided. Double Density Sys.

\$899.95

PAK #4 — 2 Double Sided. Double Density Sys.

\$919.95 PAK #5 — 2 Qume Thinline Double Sided Double Density Sys. PARTS AND PIECES \$179.95 \$249.95 \$349.95 Single Sided, Double Density Disk Drive Tandon

Double Sided, Double Density Disk Drive Qume 1 Qume Thinline Double Sided. Double Density \$39.95 Screen Clean — Clears Up Video Distortion On Your Color Computer Single Drive Cabinet with Power Supply Double Drive Cabinet with Power Supply Single Drive Disk Cable for RS Controller Double Drive Disk Cable for RS Controller \$89.95 Micro Tech Prods. Inc. LOWER CASE ROM Adapter Radio Shack BASIC Version 1.1 ROM Radio Shack Extended Basic ROM

DATA-COMP

P.O. Box 794 HIXSON, TN 37343 1-615-842-4601







THE VOICE



YOUR COMPUTER NEVER SOUNDED SO GOOD

The STEREO COMPOSER music synthesizer was developed for the true music lover. All the features available for the COMPOSER described below are also available for the STEREO COMPOSER. However, instead of using the single 6 bit digital to analog converter built into the computer and the speaker built into your TV, the STEREO COMPOSER uses two 8 bit digital to analog converters which drive two audio power amplifiers. These amplifiers supply enough audio power to easily drive your own external speakers. If you like, the output may be conceted to your home stereo system to further increase fidelity. Connection is provided by two phono connectors. If the music is too loud, two built-in volume controls are provided to allow you to control the volume of each of the channels separately. The advantage of being able to use external high quality speakers is obvious. The use of higher quality digital to analog converters serves to further increase music fidelity.

The **STEREO COMPOSER** produces music in stereo. Of the 4 voices produced, 2 are directed to each channel. This ability alone increases the realism of the music. You can even move the voices between speakers as the music plays.

The **STEREO COMPOSER** comes assembled, tested, burned in, with all the software and hardware to allow you to immediately start enjoying your music. A complete manual and examples are provided to give you everything you need.

The **STEREO COMPOSER** is completely compatible with the Radio Shack disk system. Any expansion unit will allow you to have both a disk and the **STEREO COMPOSER** operating.

Requires Extended BASIC and Minimum of 16K





The **COMPOSER** is a 4 voice music compiler which easily allows one to develop high quality music. Each voice is programmed separately. In addition, each voice uses its own waveshape table which means a unique sound for each of the 4 voices.

The **COMPOSER** features a 7 octave range. It supports dotted and double dotted notes as well as eighth, quarter, and standard triplet notes. Sixteenth and thirty second notes are also supported.

The **COMPOSER** allows the music to be played at any tempo and in any key. And believe it or not, the tempo and key can be modified as the music plays. This gives the user tremendous versatility in developing music. Key modification also allows the user to move the music up or down one or more octaves.

The **COMPOSER** displays a constantly changing random kaleidoscope pattern as the music plays. In addition, the number of the note being played is displayed which aids one in finding sour notes during music development. Both of these displays can be disabled to allow any screen to be displayed while the music is playing. In this way, one can show the words to a song or display a picture as the music plays.

The **COMPOSER** develops a machine language position independent subroutine that can be Saved, Loaded, and Executed independent of all other software. This means that you can share your music with friends. In fact, you can write your own BASIC programs that call and play the music. Software vendors may include the music in their own product.

The **COMPOSER** is menu driven making it extremely easy and friendly to use and operate. A thick operating manual is provided as well as 20 minutes of music. Many examples are given to aid the user in getting started. All you need is provided, no additional hardware is necessary. Don't let the price fool you, the **COMPOSER** has got to be heard to be appreciated. For reviews see June '83 *RAINBOW*, p. 192 and May '83 *Color Computer News*, p. 74.

Requires Extended BASIC and Minimum of 16K

 CASSETTE VERSION
 \$24.95

 DISK VERSION (32K)
 \$29.95

WHY PAY \$100 OR \$150 FOR A SPEECH SYNTHESIZER?

Buy the \$29.95 special and find out. Better yet, save your money and read one man's opinion in the August '82 issue of *CCN* on page 53. It's a fact of life that you get what you pay for. You simply can't accurately duplicate a speech synthesizer in software. Software synthesizers will give you either a limited vocabulary, use up a lot of memory, produce poor quality speech, or a combination of all three.

THE VOICE is a hardware synthesizer that plugs into the cartridge slot. It uses a sophisticated integrated circuit, the SC-01 by VOTRAX, to reproduce any word in English as well as other languages using phonemes. Phonemes are basic units of speech of which 64 are available at 4 inflections. This chip costs us \$55. If you supply the chip, deduct \$55.

THE VOICE has two outputs. Speech may be heard through the TV speaker, or the built-in audio power amplifier may be connected to your own external speaker. If the volume is too high, a built-in volume control is provided.

THÉ VOICE comes assembled, tested, burned in, with all the necessary hardware and software. A complete manual with many examples is provided to get you started in developing your own programs.

THE VOICE is completely compatible with the Radio Shack disk system. Any expansion unit will allow you to have both a disk and THE VOICE operating.

Software Included With THE VOICE

BINGO The VOICE announces the BINGO titles while you play the game.

MATH TUTOR The VOICE tutors your child in learning arithmetic.

HIGH LOW The VOICE gives you hints in guessing a number it has picked.

EDITOR This utility program will help you develop words phonetically.

THE VOICE (Hardware, Cassette, and	Disk)\$	149.95
THE VOICE (As above without SC-01)	,	94.95

THE TRANSLATOR

The translator is a machine language program that uses a built-in dictionary and a sophisticated program algorithm developed by Del Software to automatically convert text to speech. For example, A\$ "THIS IS ALMOST TOO EASY" followed by calling a USR will allow the VOICE to speak. The translator will even allow you to type words in one language (i.e. French) and have the VOICE speak in another (i.e. German). Nobody else gives you that flexibility. For 16K, 32K and 64K machines.

Software Included With The Translator

REACTION Test your reflexes as the VOICE gives you commands. **SIMON** Test your memory for numbers spoken by the VOICE.

THE TRANSLATOR (Cassette or Disk)

HOW TO ORDER

We accept GASH, CHECK, COD, VISA, and MASTER CARD orders.

Illinois residents add 5 $\!\!\!/4\%$ sales tax for the STEREO COMPOSER or THE VOICE.

Speech Systems
38W255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880

CALL ANY DAY, ANYTIME TO ORDER. YOU MAY ALSO ORDER BY MAIL.



TOM MIX SOFTWAR

TDP 100 • 3424 College N.E., Grand Rapids, MI 49505 (616) 364-4791•



graphics.

ARCADE ACTION

This one will give you

hours of exciting play. . .

Cross the busy highway to the safety of the me-

dian and rest awhile before you set out across

thes swollen river team-

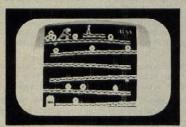
ing with hidden hazards. Outstanding sound and

"THE FROG"

(C) 1983



16K MACHINE LANGUAGE \$27.95 TAPE \$30.95 DISK



THE KING

1982 32K Machine Language \$26.95 tape \$29.95 disk

ARCADE ACTION - How high can you climb? Four full graphic screens. Exciting Sound - Realistic graphics. Never before has the color computer seen a game like this. Early reviews say: Just like the arcade - Simply outstanding!



"YAAZEE"

(C) 1983

\$19.95

6K MACHINE LANGUAGE EXT. BASIC

Yaazee is a 2 player game using five dice to get the best poker hand. After game is loaded flashing digit below player number determines which player rolls dice at the start of the game.

PROTECTORS

Exciting fast paced arcade game that looks and plays like the popular arcade game "DEFENDER",

Wave after wave of enemy fighters drop bombs on your city. Destroy them before they

destroy your city. Soon the mother ships appear firing laser blasts at you. Watch for the heat seeking mines.

\$24.95 TAPE \$27.95 DISK 32K MACHINE CODE



COLOR GOLF

Now sit at your computer and play nine or eighteen holes. Outstanding graphics in the fairway or on the green. Helps your game. 32K EXTENDED BASIC \$17.95

ADD \$1.00 POSTAGE & HANDLING MICHIGAN RESIDENTS ADD 4% SALES TAX

SPACE SHUTTLE

32K Ext. Basic

\$28 95

TAPE ONLY

This program gives you the real feeling of flight. Full instrumentation complete to the max. Actual simulation of space flight. 32K Ext. Basic



TRAPFALL"

By KEN KALISH (C) 1983



ARCADE ACTION

The "Pitfalls" in this game are many. Hidden treasures, jump over the pits, swing on the vine, watch out for alligators, beware of the scorpion. Another game for the Color Computer with the same high resolution graphics as "The King."

16K MACHINE LANGUAGE TAPE \$27.95 DISK \$30.95

KATERPILLAR ATTACK

Outstanding graphics and sound will end all of those trips to the arcade. So much like the arcade you have to see it to believe it. Requires Ext. Basic. **16K MACHINE LANGUAGE** \$21.95

DISK \$24.95

OTHER GREAT GAMES
ALL PROGRAMS REQUIRE 16K

BIRD ATTACK-A fast paced machine language arcade game. Shoot the birdmen before they descend upon you. Watch out for their bombs! 16K Machine Language

MAZE RACE-Maze race is a one or two player game. Play either against the built in timer or against your favorite opponent. 16K **Machine Code** \$17.95

SOLO POOL-Now play pool with your color computer. Two players. Plays like machine language. Super color. High resolution graphics. 16K Ext. Basic

ADVENTURES

TREK-16-Travel thru space with Spock and Capt. Kirk. Adventure. Tough! Ext. Basic. \$17.95

SHIPWRECK-Escape from a desert isle if you can. Great Adventure! Ext. Basic.

ESCAPE FROM SPECTRE (Graphic Adventure)-You are a secret agent for British Intelligence sent on a mission to obtain the secret nerve gas formula being developed by S.P.E.C.T.R.E. to destroy the world. 16K Ext. Basic

Call our BBS Number 616-364-8217 24 Hours a Day

- TOP ROYALTIES PAID
- LOOKING FOR NEW SOFTWARE



MIX SOFTWA

TDP 100 • 3424 College N.E., Grand Rapids, MI 49505 (616) 364-4791•

UTILITIES

COLOR MONITOR-Written in position independent code. (May be located in any free memory). Very compact. Only occupies 1174 bytes of memory. Full Featured. Includes Break-Pointing of machine language programs, register display and modify, memory display and modify, and block memory move commands. Displays memory in hex and ascii format on one line 8 bytes long.

MACHINE LANGUAGE \$24.95

ROM-This program is a utility that will move "most" 8K Rom-Packs to disk and allow you to run them from disk. Easy to use. Requires 64K

SCREEN PRINT ROUTINE-Using your Epson or Microline Printer. Print the screen contents on a full size 81/2 x 11 sheet. 16K Ext. Basic

TAPE DUPE Now - an all new Tape Backup Program. Even copies those hard to copy Auto-Execute Programs. Protect your software by making a backup copy. Probably the finest tape copier program ever. 16K Maching Language. TAPE \$21.95 DISK \$25.95

DISK TO TAPE. Dump the contents of most disk, to tape automatically. Machine Language.

TAPE TO DISK - Load the contents of most tapes to disk automatically. Machine Language.

MAIL LIST-Maintain a complete mailing list with phone numbers etc. Ext. Basic. DISK BASED \$17.95

THE FIXER-Having trouble moving those 600 Hex progams to disk? The fixer will help. Completely automatic. \$17.95

TAPE CAT-All new machine language program lists contents of tapes to printer. Make a catalog of your tapes. \$17.95

PROGRAM PRINTER UTILITY-This program will list basic programs to your printer in two column format. Saves paper and makes your listing look professional. Disk based.



EDUCATIONAL SOFTWARE For The Color Computer and TDP 100

STORY PROBLEMS is a program that is designed to give practice in solving STORY PROBLEMS (sometimes called STATEMENT, THOUGHT or WORD PROBLEMS) on the COLOR COMPUTER. It is suitable for use in either a home or school environment. It is also a tool that will allow you to create new story problems to suit your children's needs and ability levels. It has many features that make it particularly attractive: Story problems involving addition, subtraction, multiplication, division or a combination of the four are presented to the student by slowly scrolling each letter of each problem onto the screen. Up to 5 students may use the program at the same time. There are 4, user modifiabale, skill levels. 16K Ext. Basic **TAPE \$19.95**

CLOCK-With the ever increasing use of digital clocks, more and more young people are unpracticed in the use of the "ANALOG" clocks. You remember those, the ones with the hands. This program will attempt to teach the relationship between the two types of clocks.

REQUIRES 16K EXT. BASIC \$14.95

SPELLING TEST is designed to give a standard oral spelling test using the audio track of the computer's tape recorder to dictate test words and sample sentences. Student responses are typed on the keyboard and checked by the computer. Results are displayed on the screen and (if connected) on a printer.

REQUIRES 16K EXT. BASIC \$19.95

MATH DRILL is a program designed to help children to practice addition, subtraction, multiplication, and division skills on the COLOR COMPUTER. It has several features that make its use particularly attractive.

*Up to 6 students may use the program at the same time.

*Answers for addition, subtraction and multiplication are entered from right to left, just as they are written on paper.

*Commas may be included in the answers.

*Partial products for the multiplication problems may be some

Commas may be included in the answers.
 Partial products for the multiplication problems may be computed on the screen.
 Division answers that have a remainder are entered as a whole number followed by the letter "R" and the remainder.
 There are ten, user modifiable, skill levels.
 A "SMILEY FACE" is used for motivation and reward. Its size increases relative to the skill level.
 Skill levels automatically adjust to the student's ability.
 A timer measures the time used to answer each problem and the total time used for a series of problems.
 After a problem has been answered incorrectly the correct answer appears under (above in division) the incorrect answer.

REQUIRES 16K EXT BASIC \$19.95

WORD DRILL is designed to give a multiple choice vocabulary quiz. Words and definitions are entered into the program from the keyboard or from a tape file. The computer displays a randomly chosen definition and eight word choices. The student must enter his response before a built in timer reaches zero.

REQUIRES 16K EXT. BASIC \$19.95

SEARCH-A-WORD This Program generates a word search puzzle to your specifications. You specify the size of the puzzle and the number of words that it is to hide within the puzzle. 16K or 32K Ext. Basic.

TAPE \$17.95 FLEX VERSION \$27.95

EDUCATIONAL PACKAGE - SPELLING TEST -WORD DRILL - MATH DRILL - ESTIMATE -ALL FOR - \$69.95

ESTIMATE is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the COLOR COMPUTER. It has many features that make its use particularly attractive:

•Up to 5 students may use the program at the same time.

•There are 5, user modifiable, skill levels.

•The acceptable percent error may be changed as a student's skill.

The acceptable percent error may be changed as a student's skill

A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
 If a problem has been answered incorrectly, the student is told the

percent error and asked to try again.

If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.

A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.

The (BREAK) key has been disabled so that a child will not in-

The (BREAK) key has been disabled advertently stop the program from running.

16K EXT. BASIC \$19.95

TEACHERS' DATABASE is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive.

• Information on as many as 100 students (or more) may be in the

Cassette and disk files are completely compatable.

- Each student may have as many as 20 (or more) individual items of data in his/her record.

- The program will run from cassette or disk.

- Cassette and disk files are completely compatable.

The program is menu driven.

- Records may be easily changed, deleted, combined or added.

- Records may be reordered (ranked) based on test scores or
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- · A full statistical analysis of data may be done and sent to the printer

 Student test scores may be weighted. 32K EXT BASIC TAPE \$39.95 DISC \$42.95





Call our BBS Number 616-364-8217 24 Hours a Day • ADD \$1.00 POSTAGE & HANDLING • TOP ROYALTIES PAID • MICHIGAN RESIDENTS ADD 4% SALES TAX • LOOKING FOR NEW SOFTWARE

Save Time With *Tape Utility*

Tape Utility from Spectrum Projects is actually a set of nine operations to make living with a Color Computer a lot easier or, at least, a lot less complicated. To begin with, Tape Utility can be used with either a tape or disk system, but using with a tape-only system will yield only four of the nine operations available on the program.

The program is written in machine language and comes with a four-page documentation which was found to be fairly complete. After a *CLOADM* and *EXEC* command a menu appears for the user to select one of the many options. While the program is running, no BASIC or Disk BASIC commands are available. A command is present to return to BASIC and typing *EXEC* will start up the program again.

I would categorize this utility as one of the "make things easier" variety—that is, a program that will, for the most part, do things that are possible to do without the utility, but take a lot more time to do. With this in mind, I jumped in, as many users would, and used the program without a complete review of the documentation. The results yielded only a few surprises and, upon closer scrutiny of the instructions, I

AUTO-DIALER

BY SOUNDWORKS

- M AUTOMATIC PHONE DIALER
- ULTRA HIGH SPEED DIALING AND REDIALING
- STORE OVER 50 NUMBERS
- M NO MODEM REQUIRED
- M NO TONE SERVICE NEEDED
- SIMPLE HOOK UP
- ADAPTABLE TO ANY PHONE
- M 16K EXTENDED REQUIRED

CASSETTE \$24.95 DISK\$ 34.95

Soundworks Productions 26 EAST 7th STREET PATCHOGUE, NEW YORK 11772

MY.S. BESIDENTS: ADD 7.25% TAX

discovered most of the surprises are covered in the documentation.

What does this program do to make life easier? To begin with, tape users can print a directory, either on screen or on a line printer of a given tape. The directory will include the name of the file, type (BASIC, machine language or Data), file mode, start, end and execute addresses of each program.

Surprise number one came when I tried to terminate the reading of data before the tape was completed. *Tape Utility* will only terminate while reading data and not during a gap or blank section of the tape. Yes, this is all covered in the documentation, but it does create some problems if you read an entire cassette and want to get back to the *Tape Utility* menu. You must either restart the program or read some dummy cassette data to enable the BREAK key stop option.

Tape users may also easily make tape-to-tape copies of BASIC, machine language or Data programs. *Tape Utility* will not copy some auto-start and most copy-protected disks and tapes.

Disk users are given six more options on Tape Utility. The program will easily copy a file from disk to tape, or tape to disk and do an automatic copy of an entire disk of programs to tape. Those of you who have used the CSAVE and SAVEM command will understand how much easier it is to use Tape Utility than continuous PEEKing for start, end, and execute addresses of machine language programs. Tape Utility also includes some disk-only functions such as displaying a two-column compressed directory on screen or line printer and setting default drive number other than drive #0. Unfortunately, the disk directory given does not include start, end and execute addresses as the tape directory does. Tape Utility also does not include a simplified disk-todisk copy routine. The user must return to Disk BASIC to use the COPY command if this needs to be done. Although COPY is easy to use it would be nice to have something like it available while Tape Utility is up and running. Tape Utility also does not "fix" tape programs written in the disk operating area. Attempts to use such programs may result in a crashed disk and a very frustrated user. This surprise (number two!) is not covered in the documentation.

Tape Utility will copy programs up to 10K in length in a 16K machine and 26K in a 32K machine. Users are cautioned in the documentation that Tape Utility will not copy segmented files produced by some assemblers. Tape Utility will recover from errors that are encountered during a read of a tape file, however. This unique ability is especially valuable if you are doing long tape-to-tape or tape-to-disk copies.

The decision on whether to buy *Tape Utility* or not is really a matter of the personal preferences of the user. The program is straightforward and performs as documented. It is a matter of time saving and convenience. Decide whether you want your CoCo to do the majority of the busy work involved in copying and cataloging tapes or if you have a few extra hours to do it yourself the hard way. I prefer to have the computer do the busy work and consider this program well worth the price.

(Spectrum Projects, 93-15 86th Drive, Woodhaven, NY 11421, disk or cassette \$24.95 plus \$3 s/h)

-Brian James

PUT MORE FUN IN YOUR COLOR COMPUTER



RAINBOW-WRITER SCREEN ENHANCER

Introducing the ultimate in hi-res graphics text display. Allows your color computer to write text on any graphics screen in Rainbow colors. 16K Extended Basic required. 12 sizes to 64×24 . See accompanying ad for details. \$29.95 Cass - \$32.95 Disk.

- User definable 224 character set featuring true lowercase with descenders, improved cursor, slashed zero, Greek math symbols, lunar landers, stick figures, tanks, cars, planes, card suits, etc.
- Works in all PMODES. Four-color artifacted characters in PMODE 4 (highest resolution)!
- Pre-loader allows optimum loading in 16K, 32K or 64K machines. The 64K selection automatically transfers all ROM (including cartridge) to RAM. Uses 4-5K of memory.
- ML extension of BASIC completely interfaced and transparent incorporating direct conversion of all keys and commands including PRINT @.
- Use all day for hi-density screen displays, graph labels and listings, or incorporate into your own BASIC or ML games, word processors, etc.
- Includes demo program, tape/disk conversion instructions, character generator program, and operators manual.
- Large colored letters for children or video recorders direct from keyboard or program.



This NFL Handicapper survived the strike! Enhanced version of last year's best seller featuring...

- -Simple menu-driven selection of schedules, ratings, division races, predictions or results by team or week. 7 different types of reports to screen or printer (optional) available each week.
- -Easy one-a-week entry of scores no complex stats.
- -Predicts all games for remainder of season each week.
- -Calculates projected won/loss records for all weeks.
- -Maintains home field advantage rating as well as power rating for each team for accurate predictions.
- -Allows user schedule entry. 1983 schedule and ratings info included free—ready to run.
- -Tracks computer's accuracy by team and week.

32K enhanced version features dazzling Rainbow-Writer screen displays. 16K abridged version included free. 16/32K Extended Basic required. 2 tape cassette \$29.95; 16/32 Disk \$32.95. Previous owners call for upgrade plus data tape.



Dungeons, wizards, treasure chests, hidden trap doors and more. If you enjoy challenge and complexity, these adventure games are for you. Featuring real-time graphics with arcade sound for your color computer. "Scepter" requires 16K Extended Basic. \$16.95 Cass - \$19.95 Disk. Hi-res sequel "Conquest" 16K Extended Basic Cass \$21.95; 32K Disk \$24.95.

Discover the Rainbow in your Color Computer!

	ITEM	CASSETTE/DISK	PRICE	NAME	
RAINBOW				ADDRESS	
CONNECTION				CITY	
SOFTWARE		Sub Total		STATE	ZIP
RAINBOW CONNECTION SOFTWARE 3514 6th Place NW, Suite D Rochester. MN 55901		Shipping nnesota residents add 6% Sales Tax Visa & M. C. add 3%	\$2.00	Personal checks welcome - no delay. Dealer inquiries invited. Send SASE for catalog.	
507-288-4424	Ехр	TOTAL		Not affiliated with THE RAINBOW	V/SA*

Humbug For the MC-10

Shortly after reviewing the new MC-10 "PoCo CoCo," I received a telephone call from Pete Stark of Star-Kits. Yes, in the same issue in which I stated that machine language was apparently not supported by the MC-10, an ad appeared for *Humbug*. Anyone familiar with *Humbug* knows it's one of the nicest monitor programs for the CoCo. Thanks to Pete, we now know that there is an *EXEC* and even a *CLOADM* command that are undocumented.

Taking advantage of the hidden commands, Humbug appears to be the first piece of commercial software for the PoCo. As I am machine language oriented anyway, I cannot think of a more useful tool for exploring the new computer. There is only one minus, the availability of memory. With only 4K of on-board memory, Humbug occupies a little less than 3K. After housekeeping and screen memory only around 400 bytes remain for user programs. Radio Shack is already advertising a 16/20K upgrade module, so, by the time you read this, the memory limitation should not be a problem. To combat this problem three different versions are available at different memory locations as the 6803 Processor is not capable of position independent code.

Before covering the different commands available, let me say something about the manual. The 25 pages of excellent instructions are not only complete with source code, but also contain a wealth of information on the MC-10, a memory map along with several addresses of key ROM calls.

UPLOAD

\$16.95

This is the UPLOAD side of DLOAD and DLOADM in Extended Color Basic. Send a basic or machine program to another ECB Color Computer. Programs can be passed directly or by phone if both computers are hooked to modems. (not supplied). Uploaded program arrives at the receiving end ready to save, run, or execute. Patch to correct the flaw in DLOADM is supplied in public domain.

INDEXER

\$14.95

Program produces a sorted list of variables and line numbers used in your basic program. Following each variable or line number will be a listing of the numbers of the basic lines which contain the variable or line number. RUNning the basic program is not required. Bonus! Global search of basic program for a variable, a text string, or a basic keyword.

Fast machine language 16K/32K EXTENDED BASIC, Tape or RS Disk Add \$2.00 for shipping and handling



ML-US'R SOFTWARE 115 RISING SUN, Dept R FORT MITCHELL, KY 41017



The manual can be considered a standard of comparison and is alone worth the cost of the software. For example, one of the addresses points out the fact that Radio Shack didn't use the on-board serial interface for the RS-232 port. Addresses are given with proper values to control the RS-232 Baud rate from 110 to 2400 Baud. There is even a command to change the Baud rate.

Commands

Following is a summary of the commands implemented by *Humbug*. A detailed description of the operation of each command is given in the operation manual. A few are worth noting. The AT or analyze tape command will document the contents of an unknown tape, giving you the program name, format, number of bytes and the start, end and execution addresses. The FI command will allow you to scarch any section of memory for a hex string. The SA commands allow you to make machine language tapes. Full breakpoint control and single-stepping of programs is supported.

AD — Formatted ASCII Dump

AI — ASCII Input

AO — ASCII Output

AT — Analyze Tape

BA — Change Baud Rate

BP - Print Breakpoints

BR — Set/Reset Breakpoints

CO - Continue

CS — Checksum Memory

DE — Desemble

EX — Exit to BASIC

FI — Find 1, 2 or 3 bytes

FM — Fill memory with constant

HD — Hex dump

HE - Print command codes

JU — Jump to program

MC — Compare memory

ME — Memory examine and change

MM — Move memory

MT — Memory test

RC — Register change

RE — Register examine

SA — Save ML to cassette!

SS — Single-step

ST — Start single-step

!! — Monitor reset

I/O Control

Humbug has a unique feature using the SHIFT-@ combination that is used in BASIC to pause operation. When a SHIFT-@ is encountered one of four commands can follow. A "P" will toggle the pause mode which pauses screen output after every 16 lines for examination. The letter "O" turns the RS-232 port on and off for printer output. Hitting BREAK will cancel any program and return to the monitor prompt. Any other keys will resume the program. Summary

As *Humbug* has been around on many other 68XX systems for quite a while, you will have no problems with operation. It is time- and user-tested and this reviewer played with the commands for quite a while and found no problems. You will find commands not available on most computer monitors in *Humbug*. I recommend it to anyone who wants to run machine language programs on their new

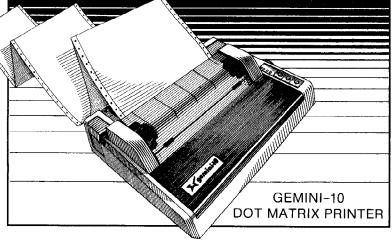
(Star-Kits, P.O. Box 209-R, Mt. Kisco, NY 10549, \$29.95 on tape)

—Dan Downard

Jul SKYLINE

Your largest single source of programs and products for the COLOR COMPUTER / TDP 100

THE GEMINI-10 AN ASTRONOMICAL ARRAY OF FEATURES FOR A DOWN-TO-EARTH PRICE



MORE QUALITY: 100 cps • thruput time of 48 lpm • high resolution (120x144) bit image & block (6x6) graphics • extra fast forms feed

MORE FLEXIBILITY: super/sub script • underlining • backspacing

- double strike mode emphasized print mode 2.3K buffer
- compatible with most software supporting leading printers 10" carriage 15" carriage Gemini-15 available

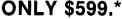
MORE RELIABILITY: 180 day warranty (90 days for head & ribbon)
• mtbf rate of more than 5 million lines • print head life of more than 100 million characters

THE POWER BEHIND THE PRINTED WORD.

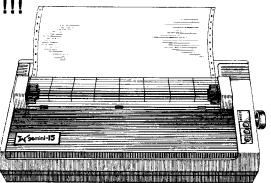
SAVE \$130.00!!!

The perfect business printer at the perfect price!

Wide 15" carriage handles any accounting report or spreadsheet assignment. Same great features as Gemini-10. Complete package as described above. A \$729.00 value for



Printer only, \$519.*



SKYLINE 64K Memory Upgrade Kits

8 guaranteed 200 n.s. 64K memory chips, solderless installation instructions, Skyline's 64K BOOT and PAGER progams (a \$19.95 value). All for the super low price of \$59.00! Order yours today!

SAVE \$80.00!!!

Our incredible Gemini-10 package - a PRINTING SYSTEM ready to plug in to your Color Computer. NOTHING MORE TO BUY. Includes serial to parallel converter, graphic screen print software, deluxe user manual, and 5 minute setup instructions! A \$479.00 value. Complete package ONLY \$399*.

Parallel printer only, \$319.* Order yours today!



ORDERING INFORMATION

ALL ITEMS SHIPPED

FROM STOCK Phone orders

may be placed at:

(312) 260-0929

(Our voice line).

or with your

computer at:

(312) 588-7917

(Our MODEM line)

C.O.D. orders gladly accepted, \$2.00 additional.

Mail orders should be sent to:

SKYLINE MARKETING 442 Sunnyside Wheaton, IL 60187

*\$10 shipping & handling fee on all printers.





De-Mystifying PCLEAR 0

-Ron Krebs

everal articles and hints have been published outlining the techniques and desirability of performing PCLEAR0 on the CoCo to provide maximum available memory. There is some confusion however, regarding the possibility and/or proper method of doing a PCLEAR0 when using the disk system. Please review your Extended BASIC manual if you are not completely familiar with the PCLEAR statement.

Let's review for a moment the method of doing a *PCLEAR 0* without the disk system:

Type: POKE&H19,6:NEW (ENTER)

The *POKE* instruction causes a value of 6 to be poked into location \$19. Memory locations \$19 and \$1A (Decimal 25 and 26), combine to form a 16 bit pointer register which tells BASIC where the main source buffer is located. Memory location \$1A is '0' so the *POKE* operation sets the two byte pointer to \$0600. After the pointer is initialized, the *NEW* statement causes other BASIC registers to adjust accordingly.

But here is the important point:

When power is first turned on, BASIC causes the memory

(Ron Krebs has many years of 6800/6809 programming experience along with a background in technical sales and management. Ron and his wife Mona own Mark Data Products.)

cell at location \$0600 to be cleared because it requires the first byte of the source buffer to be cleared for proper operation. Now, let's observe what happens to memory when power is first applied to the CoCo. If you have a means of sequentially *PEEK*ing through memory you will generally find that the dynamic RAM used in your CoCo will have alternating bytes set to 0 and \$FF. Depending on the memory chips used, your CoCo may have all the even bytes set to zero or it may be the odd ones.

Next, let's look at a possible means of performing a *PCLEAR 0* with a disk system. After reserving some RAM for the DOS, we decide to locate the source buffer at \$0E00:

Type: POKE&H19,&H0E:NEW (ENTER)

This should do it, but we find that it works with some computers and doesn't with others! Why? Because we don't know if the byte at location 0E00 is cleared or not! On some computers it will be and on others it won't. We have now identified the problem and the solution is easy. To PCLEAR θ with a disk system installed:

Type: POKE&H19, &H0E:POKE&H0E00, 0:NEW

The second *POKE* statement does the trick! BASIC has the required zero byte at the beginning of the buffer and will be perfectly happy. Your CoCo has more memory to work with and I hope that makes you happy too!

Marymae INDUSTRIES, INC.

In Texas, Orders, Questions & Answers 1-713-392-0747 22511 Katy Freeway Katy (Houston), Texas 77450 To Order 1-800-231-3680 800-231-3681

SAVE BIG DOLLARS ON ALL TRS-80® HARDWARE & SOFTWARE

TRS-80° by Radio Shack. Brand new in cartons delivered. Save state sales tax. Texas residents, add only 5% sales tax. Open Mon. - Fri., 9 - 6, Sat., 9 - 1. We pay freight and insurance. Come by and see us. Call us for a reference in or near your city. Ref: Farmers State Bank, Brookshire, Texas.

WE OFFER ON REQUEST

Federal Express (overnight delivery)

Houston Intercontinental Airport Delivery, Same Day Service

U.P.S. BLUE-Every Day

References from people who have bought computers from us probably in your city. We have thousands of satisfied customers. WE WILL NOT BE UNDERSOLD!

ED McMANUS



0

No Tax on Out of Texas Shipments!

Save 10% 15%

WE ALWAYS OFFER

- We accept MasterCard, Visa and American Express cards
- ✓ We use Direct Freight lines. No long waits
- ☑ We always pay the freight and insurance
- ☑ Toll free order number
- Our capability to go to the giant TRS-80®

 Computer warehouse 5 hours away, in Ft. Worth, Texas, to keep you in stock.

© TRS-80 is a Registered Trademark of Tandy Corp.

JOE McMANUS



TELEX: 77-4132 (FLEXS HOU)



The Dragon Is Coming!

By Bob Rosen

Just what is this Dragon 32 that you see on the upper left hand corner of the cover of Rainbow Magazine? The Dragon 32 is England's answer to the Color Computer. (And a most impressive answer it is!) To start with, the first thing you notice when you see it, is that it has an improved keyboard. Upon closer inspection, it is similar to the original Model I keyboard manufactured by Hi-Tek. It is a standard 53 key Qwerty keyboard with a very nice smooth feel to it. Upon powering up, you get the following logo:

(C) 1982 DRAGON DATA LTD,16K BASIC INTERPRE TER 1.0,

(C) 1982 by MICROSOFT

As you can guess, it is the same Microsoft who wrote the BASIC for the Color Computer. To my surprise when comparing the Quick Reference Card of the Dragon 32 to that of the CoCo, they have the exact error codes and statements except for DLOAD. The reason DLOAD is missing is that the Dragon 32 has no serial port. Instead it has a parallel port. One interesting command I noticed on the Dragon Quick Reference Card is the presence of a PRINT#-2 command instead of the usual LPRINT commands associated with parallel ports. This eliminates changing all the PRINT #-2 commands of a Color Computer program to LPRINT commands. Even though the commands are the same, the actual BASIC is different from the Color Computer. This is because TANDY has exclusive rights to their version of Microsoft BASIC for the Color computer. While not all CoCo BASIC programs will run as is on the Dragon 32, I tried several RS Program Paks and they all worked correctly. I even tried a long machine language program (Donkey King) and had no problems. Included with my Dragon 32 was a pamphlet of programs for it. This list has programs from Spectral Associates and Mark Data that have been

previously sold for the CoCo. This leads to the assumption that even though CoCo programs may not run "as is" on the Dragon, they can be converted to do so.

The Dragon 32 is aptly named as it comes stock with 32K of RAM. Unlike the 32K CoCo from Radio Shack, Dragon uses two sets of 16K chips instead of eight 64K chips. There are various hardware differences in the Dragon. The Dragon uses the PAL TV system instead of the U.S. NSTC system. Since there are no VHF TV stations in England, the RF output is on channel 33 and the bandwidth is eight mhz instead of six. The video mixer chip is a LM1889 instead of a MC1372. The power supply (220 volts, 50 hz) is outside the computer and is connected via a DB-9 socket on the back next to the power switch. The two joystick, cassette and parallel printer jacks are on the left side along with the RF output and reset button. The Program Pak port is on the familiar right hand side but there is no door. The Dragon 32 has one jack that the stock CoCo doesn't have. There is a five pin din jack on the back for video out. This is a decided advantage for those who want to do word processing to its

To summarize, the Dragon 32 is a fine computer with very close similarities to the Color Computer. The extra features of a better keyboard, parallel printer port, video output jack and white case are a definite advantage. But the best news is that a Dragon will soon be coming to your neighborhood! Starting this summer, a U.S. version of the Dragon will begin production in Louisiana. It will be a NSTC version with a serial port. Price will be very competitive with the Color Computer and will give potential Color Computer buyers another choice.



AUDIO AND VIDEO INTERFACE

Provides SWITCHED color or monochrome 750hm, 1 volt p-p video from CoCo. If you wish to use a high resolution monitor this interface is a must. Separate enhancements are provided for color and monchrome outputs.

This is not a simple emitter-follower add-on.

*UNIT DOES NOT REQUIRE SOLDERING

*INTERFACE IS ASSEMBLED AND TESTED

*400mw AUDIO @ 8 ohms

*TWO YEAR WARRANTY

Price \$49.95 (Includes Shipping)

FREELAND ENG.

7503 N. Kerby, Portland, OR 97217

Give us your best: Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in the Rainbow's Scoreboard column. All entries must be received by the first of the month to be eligible for the following month's Scoreboard.

* New Number One

☆ Last Month's Number One

SCORE	PLAYER * No	w Number (One
ALCATRAZII (Spectral Associates)	COLOR INVADI	ERS (Computery
8,710 ☆	Kanti Dinda, Kingston, Ontario	240,700 ☆	Roland Hendel
ASSAULT (Com	Kevin Mesecher, Ft. Walton Beach, FL	227,050 217,635	John Osborne, Jim Baker, Flo
ASTRO BLAST	(Mark Data)	126,350	Perry Denton,
158,000 ☆ 104,464	Jim Baker, Florissant, MO		Craig Edelheit,
98,000	Tim Warr, Bellingham, WA	1,253,200 292,000	Jeff White, Pra Roland Hendel
92,000 92,000	Harry Sawyer, Watchung, NJ Roland Hendel, Mississauga, Ontario	292,000	Vince Lok, Mis
66,525	Andrew Puglise, Aliquippa, PA	252,050 COLORPEDE (I	Larry Plaxton,
53.000 39,575	Peter Niessen, Carlisle, MA Jennifer Parry, Batavia, IL	2,745,982	Roland Hendel
AVENGER (The	Cornsoft Group)	2,400.735 2,139,248	Scott Sehlhors Mike Hall, Har
19.480 ★ 19,220 ☆	Jim Sparke Vince Lok, Mississauga, Ontario	2,005,227	Jennifer Maxey
14,075	Stephen Lai, Palatine, IL	1.723.937 1,029,157	Roger Lamb. S
11,560 8,305	Peter Niessen, Carlisle, MA Jimmy McDonald, Summerville, SC	636,401	Jeff Jackson, I Alan Tepfer, F
BIRD ATTACK	(Tom Mix)	336,162	Shawn McAlpir MAN (The Corns
200,725 ★ BLOC HEAD (C	Peter Niessen, Carlisle, MA Computerware)	976,520 🕏	Bruce Thornhil
40,250 🏠	Ed Bottini, St. Louis, MO	772.000 600,410	Keith Seifried, Roland Hendel
19,300 17,400	Jim Ganninger, Des Peres, MO Brad Ilowit, Orlando, FL	539,100	Larry Plaxton, Brad Widdup,
BUSTOUT (Rad	dio Shack)	391,690 COLOR ZAP (S	Brad Widdup, pectral Associate
34,700	Derrick Kardos, Colonia, NJ Sara Hennessey, Golden Valley, MN	227,330 🖒	Ron Rhead, W
28,720 27,880	Perry Denton, New Baden, IL Mike Wells, Pittsburgh, PA	50,800 COLOUR PAC	Scott Sehlhors ATTACK (Compi
17,170	Neil Berkman, DeWitt, NJ	472,465 公	Jim Baker, Flo
4,508	Lew Gage, Cornish, NH BER (Radio Shack)	211,000 193,000	Roland Hendel Cameron Amic
118,000 *	Kevin Boehm, Springfield, IL	154,600	Greg Lesher, N
95,600 TA 84,800	Kyle Keller, Overland Park, KS David Mix, Logansport, IN	112,730 45,150	Mike Wells, Pit Chris Harland,
84,500	J.C. MacDonald, Charlottetown, P.E.I.,	CONQUEST OF	KZIRGLA (Rain
72,000 61,499	Jeffrey Nozar, Beavercreek, OH Ronald Sperling, Canyon Country, CA	10,399	Bruce Uher, C Scott Sehlhors
58,900	Beth Moore, Memphis, TN	COSMIC CLON	ES (Mark Data)
58,000 53,800	Danny Woodfin, Williamstown, WV Bryan Moore, Memphis, TN	CROSSWORDS	John Osborne, (Radio Shack)
50,200	Barney Merrill, Whiteman AFB, MO	322 🟠	Bob Strong, C
45,800 40,400	Paul Hensel, Jackson, MI Troy Fryfogle, Lapeer, MI	75,431 T	Jeff Willard, Ci
29.600	Tom Hilton, High Point, NC	41,272 33,777	Perry Willard, Dawayne McKi
27,000 19,700	Mike Wells, Pittsburgh, PA Himat Mongia, Atlanta, GA	30.119	Trey Lowery, C
CATCH 'EM (As	ardva		ctral Associates) Greg Scott, Or
91,000	Crary Edelheit, W. Bloomfield, MI Dean Bouchard, Kingston, N.S.		Computerware)
70,157	Kirk Beler, Taber, Alberta		Bobby Bruce, Marc Hassler
65,768 CATERPILLAR	Laura Sandman, Louisville, KY (Aardvark)	1,152,360 ☆ 825,000	John Cole, Kir
63,100 🟠	Todd Byington, N. Salt Lake, UT	770,000 83,070	Peter Stumpt, N Andrew Puglis
53,233 31,742	Ron Pinson, Guelph, Ontario Daniel Milbrath, Ann Arbor, MI	DOUBLEBACK	(Radio Shack)
30,029 27,549	Ron Rhead, Willowdale, Ontario Mike Hochster, Ann Arbor, MI	435.570 公 429,000	Phillippe Morsa Steve Damm, I
12,548	Chris Harland, Regina, Saskatchewan	228,690	Paul Moritz, B
CAVE HUNTER 42,600 ☆	(Mark Data) Gary Ritchie, Bellevue, Alberta	195,640 191,830	Terry Steen, S Chris Kulawy,
27,050	Jim Baker, Florissant, MO	56,400	Jim Suttles, Da
26,300 21,150	Mike Hughey, King George, VA Jim Baker, Florissant, MO	33,704 DUNKEY MUNI	Stephane Char (EY (Intellectron
8,230	Mike Wells, Pittsburgh, PA	1,618,800 🕁	Bryan Bloodwo
72,840 ★	LLOONS (Radio Shack) Lyman Green, Jr., Dayville, CT	1,437,200	Mike Wells, Pit Jodi Knudsen,
65,050 🕁	Brian Gould, Basking Ridge, NJ	1,099,400	Andrew Herror
64,130 62,100	Doug Schofield, Plainfield, IL Greg Lesher, North Chili, NY	1,000,500 FIRECOPTER	Wendy Johnso Adventure Intern
61,700	Dan Dowling, San Bruno, CA	113,880 🔫	Steve Skrzynia
53,530 45,270	Jennifer Sanzone, Blacksburg, VA Stephane Charbonneau, Montreal	THE FROG (To 47,360 ★	m Mix) Jeannie Hawki
33,000	Jonathan Dietz, Ann Arbor, MI	30,500 🟠	Frank Bottini,
22,050 A	RE — formerly Berserk (Mark Data) Jim Baker, Florissant, MO	16,770 15,400	Missy Buisson, Debbie Purdy,
17,850	Brian Wallingford, Fall River, MA	12,340	Steve Skrzynia
14,650 14,350	Todd C. Hauschildt, Red Wing, MN Mike Hughey, King George, VA	17,945 🛊	
12,600	Tim Warr, Bellingham, WA	8,600 💢	Tim Warr, Bell
7,800 7,600	Brad Widdup, Dundas, Ontario Mike Wells, Pittsburgh, PA		omputer Island) Aaron T. Cinc
7,600	David Iverson, Dorval, Quebec	W.	The second secon
5,250	Eric Lund, Millington, NJ		

```
Mississauga, Ontario
Kincardine, Ontario
rissant, MO
 New Baden, IL
 Associates)
, W. Bloomfield, MI
airie de Chien, WI
II, Mississauga, Ontario
ssissauga, Ontario
Medley, Ontario
   Mississauga, Ontario
 st. Columbia. SC
y, Kalamazoo, MI
St. Petersburg, FL
Littleton, CO
Ft. Wayne, IN
in, Louisville, KY
ill, Barrhead, Alberta
 Greenville, OH
I, Mississauga, Ontario
Medley, Alberta
Dundas, Ontario
es)
/illowdale, Ontario
st, Columbia, SC
uterware)
prissant, MO
d, Mississauga, Ontario
k, Mississaya, Chiano
Ck, Reisterstown, MD
North Chili, NY
ittsburgh, PA
Regina, Saskatchewan
nbow Connection Software)
Coshocton, OH
st, Columbia, SC
   Kincardine, Ontario
 Chicago, IL
Chireno, TX
Chireno, TX
inney, Chireno, TX
Chireno, TX
 rlando, FL
 Springfield, MO
ing City, Ontario
McHenry, IL
sc, Aliquippa, PA
an, St. Jerome, Quebec
Phoenix, AZ
Butte, MT
San Bernardino, CA
 St. Johnsville, NY
Payton, TN
Phonneau, Montreal
irbonneau, Montreal
nics)
oorth, Federal Way, WA
ittsburgh, PA
, Kenosha, WI
in, High Point, NC
on, San Jose, CA
 arz, Tacoma, WA
 ins. Deltona FI
 St. Louis, MO
, Snellville, GA
, Dearborn, MI
 irz, Tacoma, WA
 rz, Tacoma, WA
 lingham, WA
```

otta, Peru, IN

```
.ER (Spectral Associates)
Randy Gerber, Wilmette, IL
John Osborne, Kincardine, Ontario
Chris Kulawy, St. Johnsville, NY
Bobby Bruce, Springfield, MO
Jeff Morris, Seattle, WA
Jennifer Parry, Batavia, IL
Daniel Milbrath, Ann Arbor, MI
Kirk Mesecher, Ft. Walton Beach, FL
                           825,250
255,000
                               142,070
                               125,000
                             110,190
67,270
57,770
37,970
   GOLF (Aardvark)

40 ★ Matthew Brenengen, Lakelmo, MN
GRABBER (Tom Mix)

44,100 ★ Steve Skrzyniarz, Tacoma, WA
GRANPRIX (Computerware)

5,875 ★ Steve Skrzyniarz, Tacoma, WA
   5.875 ★ Steve Skrzyniarz, Tacoma, WA

INVADERS REVENGE (Med Systems)
451.060 ★ John Osborne, Kincardine, Ontario
32.600 Harry Sawyer, Watchung, NJ
16.300 Eric Lund, Millington, NJ

KATERPILLAR ATTACK (Tom Mix)
163.526 ★ Andy Truesdale, Ferguson, MO
14.211 Roland Hendel, Mississauga, Ontario
Warren Schubert, Newfoundland, NJ
12.544 Todd C. Hauschildt, Red Wing, MN
8.902 Peter Niessen, Carlisle, MA
7.877

KEYS OF THE WIZARD (Spectral Associates)
640 ★ Steve Skrzyniarz, Tacoma, WA

THE KING (Tom Mix)

Andy Truesdale, Ferguson, MO
                                                                                                                               Andy Truesdale, Ferguson, MO
Mike Hughey, King George, VA
Joel Doucet, Yarmouth, Nova Scotia
Frank Bottini, St. Louis, MO
                   4.040,300
1,858,000
                     1,670,200
       1,109,900 Scott Sehlhorst, Columbia, SC
355,300 Eric Lund, Millington, NJ
227,000 Robert Lang, Port McNeill, B.C.
141,500 Kirk Mesecher, Ft. Walton Beach, FL
KOSMIC KAMIKAZE (IMB)
       KOSMIC KAMIKAZE (IMB)

200,550

★ Fred Iha, Columbus AFB. MS.
49,900

10,700

Larry Mesecher, Ft. Walton Beach, FL
Kirk Mesecher, Ft. Walton Beach, FL
Kevin Mesecher, Ft. Walton Beach, FL
LANCER (Spectral Associates)

73,200

→ Jeff Jackson, Littleton, CO
57,150

Steve Skrzyniarz, Tacoma, WA
Miles Langmacher, Minco, OK
52,700

MEGA-BUG (Radio Shack)
     52,700 Kirk Blankenship, Littleton, CO

MEGA-BUG (Radio Shack)
60,000 A Robin Worthem, Milwaukee, WI
16,832 Logid Harden Share Share
         MEGAPEDE (Computerware)
67,605 ☆ Ed Bottini, St. Louis, MO
53,019 Jim Ganninger, Des Peres MO
```

******************* PLAYER SCORE SCORE PLAYER SCORE PLAYER METEOROIDS (Spectral Associates)
140,210 ★ Fred Iha, Columbus AFB, MS
MICROBES (Radio Shack) METEOROIDS (Spectral Associates)

140,210 ★ Fred Ina, Columbus AFB, MS

MICROBES (Radio Shack)

318,830 ★ Hwan Joo, Weston, Ontario
316,200 Steve Mayer & Keith Seifried, Greenville, OH

259,700 Sheila Coleman, Griffin, GA
244,700 Ian Waters, North Hero, VT
96,370 Brad Widdup, Dundas, Ontario
94,700 Daniel Milbrath, Ann Arbor, MI
85,100 Allen Roth, Dayton, TX ★
66,750 Dean Ritchey, Satellite Beach, FL
45,420 Ronald Sperling, Canyon Country, CA

MOCROCO GRAN PRIX (Computerware)
4,153 ★ Frank Bottini, St. Louis, MO

MON HOPPER (Computerware)
809,750 ★ Ed Bottini, St. Louis, MO

MONKEY KONG (Med Systems Software)
1,182 ★ Rich VamManen, Grand Rapids, MI
1,072 Justin Marcus
1,052 Ryan VanManen, Grand Rapids, MI
1,072 Justin Marcus
1,052 Ryan VanManen, Grand Rapids, MI
1,072 Justin Marcus
1,052 Ryan VanManen, Grand Rapids, MI
1,072 Justin Marcus
1,052 Ryan VanManen, Grand Rapids, MI
1,074 Justin Marcus
1,055 Ryan VanManen, Grand Rapids, MI
1,075 Hyan VanManen, Grand Rapids, MI
1,076 Larry Plaxton, Medley, Alberta
963 Mark Dowling, San Bruno, CA
863 Billy Bruce, Springfield, MO
764 Bobby Bruce, Springfield, MO
764 Monster MAZE (Radio Shack)
520,470 ★ Robert L. Bull, Trenton, Ontario
923,490 Paniel Milbrath, Ann Arbor, MI
100,200 Lew Gage, Cornish, NH
62,400 Ruben Lipszyc, Sarnia, Ontario
NERBLE FORCE (Computerware)
315,150 ★ Frank Bottini, St. Louis, MO
1JIBBLER (Color Quest)
14,910 ★ Christal Glovinsky, Staten Island, NY 4,455
4,390
Himat Mongia, Atlanta, GA
POPCORN (Radio Shack)
560,900
Steve Johnson, Santa Ana, CA
136,530
Scott Sehlhorst, Columbia, SC
110,570
Gameron Amick, Reistertown, MD
96,470
Mike Wells, Pittsburgh, PA
83,140
Brad Widdup, Dundas, Ontario
75,000
Chris Harland, Regina, Saskatchewan
46,610
Daniel Milbrath, Ann Arbor, MI
43,540
Lew Gage, Cornish, NH
0,350
PROTECTORS (Tom Mix)
594,610
September 10
September 11
September 10
Septem 53,520 ★ Jim Baker, Florissant, MO
53,400 ★ Ed Bottlini, St. Louis, MO
15,520 Kirk Mesecher, Ft. Walton Beach, FL
12,275 Larry Mescher, Ft. Walton Beach, FL
7,000 Kevin Mescher, Ft. Walton Beach, FL
1,197,800 ★ Steve Skrzyniarz, Tacoma
1,146,750 ★ Brian Austin, Rott
1,146,750
939,300 Justin Marcus
Robert Kiser, Monticello, MS
Matthew Brenengen, Lakelmo, MN
Kirk Beler, Taber, Alberta
Ben Kish, Austin, TX 939,300 843,700 49,200 Jim Ganninger, Des Peres, MO
NIBBLER (Color Quest)
14,910 ☆ Christal Glovinsky, Staten Island, NY
NINJA WARRIOR (The Programmer's Guild)
27,500 ★ Jeff Teague, Noblesville, IN
OFFENDER (American Business Computers)
965,400 ☆ Jim Baker, Florissant, MO
113,200 Justin Marcus
76,350 Johnna Miller, Plymouth, MN
PAC-ATTACK II (Computerware) 604,200 553,650 604,200 Kirk Beler, Taber, Alberta
553,650 Ben Kish, Austin, TX
464,380 Brad Widdup, Dundas, Ontario
232,850 Peter Stumpf, McHenry, IL
ROBOT BATTLE (Spectral Associates)
21,000 ★ Bobby Bruce, Springfield, MO
SCARFMAN (Cornsoft)
371,540 ★ Stanley Sneed, Erwin, TN
SEA DRAGON (Adventure International)
60,430 ★ Steve Skrzyniarz, Tacoma, WA
36,540 Steve Skrzyniarz, Tacoma, WA
36,540 Steve Skrzyniarz, Tacoma, WA
36,540 Steve Schweitzer, Sewell, NJ
14,970 Ron Rhead, Willowdale, Ontario
SHAFT (Prickly-Pear Software)
18,150 ★ Loren Seng, Tuscon, AZ
SHARK TREASURE (Computerware)
72,000 ★ Marc Hassler
50,000 Ed Bottini, St. Louis, MO
SHOOTING GALLERY (Radio Shack)
37,200 ★ Chris Kulawy, St. Johnsville, NY
37,080 Gary Long, Peru, NY
31,200 Ronald Sperling, Canyon Country, CA
30,910 Chris Olson, Mt. Pleasant, IA
28,500 Kenneth Partridge, Warkworth, Ont.
SKIING (Radio Shack)
31,52 ★ Andy Truesdale, Ferguson, MO 46,300 Brad Widdup, Dundas, Ontario
STORM (Computerware)
840,010 ☆ Roland Hendel, Mississauga, Ontario
723,335 Chris Sweet, Harvard, MA
472,320 John Jaworski, Nashua, NY
380,000 Cameron Amick, Reisterstown, MD
240,745 Todd Hauschildt, Red Wing, MN
170,775 Andrew Puglise, Aliquippa, PA
60,265 Peter Niessen, Carlisle, MA
STORM ARROWS (Spectral Associates)
94,000 ☆ Steven Ohsie, Houston, TX
TRAPFALL (Tom Mix) TRAPFALL (Tom Mix)

84,542 ☆ Keith Seifried, Greenville, OH
77,490 Peter Stumpf, McHenry, IL
59,163 Frank Bottini. St. Louis. MO
47,022 Peter Niessen, Carlisle, MA
29,752 Steve Skrzyniarz, Tacoma, WA 30,910 Chris Olson, Mt. Pleasant, IA
28,500 Kenneth Partridge, Warkworth, Ont.

SKIING (Radio Shack)
31.52 ★ Andy Truesdale, Ferguson, MO
40.10 ☆ Fred Herrmann, Flemington, NJ
49,43 John Scanlan, Prairie Village, KS
52.22 Peter Johnson, Chino, CA
53.57 Jay Stewart, Delhi, NY
1.08.02 Kevin Boehm, Springfield, IL
1:13.13 Daniel Milbrath, Ann Arbor, MI
1:13.17 Jonathan Dietz, Ann Arbor, MI
SKY DEFENSE (Quasar Animations)
9,700 ☆ Vince Lok, Mississauga, Ontario
6,700 Mike Anheluk, Fall Creek, OR
6,120 Steve Skrzyniarz, Tacoma, WA
5,200 Cameron Amick, Reisterstown, MD
SOLO POKER (Radio Shack)
640 ☆ Mary J. Herring, Bloomington, IL
SOLO POOL (Tom Mix)
103 ☆ John Fraysse, Dahlren, VA
SPACE RACE (Spectral Associates)
983 ☆ Matt McMann, New Boston, MI
SPACE AMBUSH (Computerware)
124,460 ☆ John Osborne, Kincardine, Ontario
SPACE ASSOLUT (Radio Shack) 47,022
29,752
Steve Skrzyniarz, Tacoma, WA
VENTURER (Aardvark)
2,152,150
\$\pmodermode{\text{Greg}}\$ Greg Scott, Orlando, FL
1,769,400
Todd Hauschildt, Red Wing, MN
1,526,200
Peter Niessen, Carlisle, MA
1,126,550
Hwan Joo, Weston, Ontario
919,650
Richard Vehlow, Bayside, NY
784,100
Brad Widdup, Dundas, Ontario
240,650
David Iverson, Dorval, Quebec
WHIRLYBIRD RUN (Spectral Associates)
25,500
Dennis Goehring, Mississauga, Ont.
WILDCATTING (Radio Shack)
23,571
Denny Petkash, Warren, MI
ZAKSUND (Eitle Software)
950,500
Michael Rothman, Solon, OH
617,500
Ed Bottlini, St. Louis, MO
228,900
Tim Smith, San Rafael, CA
19,650
Jeff Fisher, West Branch, MI
98,300
Alan Tepfer, Ft. Wayne, IN
79,450
Brad Widdup, Dundas, Ontario
ZAXXON (Datasoft) SPACE AMBUSH (Computerware)

124,460 ☆ John Osborne, Kincardine, Ontario

SPACE ASSAULT (Radio Shack)

238,580 ☆ John Cole, King City, Ontario

221,130 Steve Johnson,Santa Ana, CA

216,680 Chris Kulawy, St. Johnsville, NY

160,832 Rich Vanmanen, Grand Rapids, MI

157,140 Daniel Milbrath, Ann Arbor, MI

59,620 Mike Hochster. Ann Arbor, MI

55,800 Chris Harland, Regina, Saskatchewan

49,820 Himat Mongia, Atlanta, GA

44,280 Dean Ritchey, Satallite Beach, FL

37,560 Jim Baker, Florissant, MO

35,200 Allen Roth, Dayton, TX *

33,000 Mr. Bruce, Springfield, MO

15,870 Mike Wells, Pittsburgh, PA

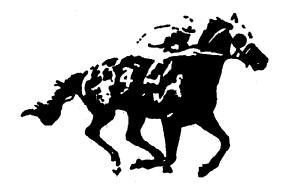
10,390 David Iverson, Dorval, Quebec

Kirk Mesecher, Ft. Walton Beach, FL 58,240 Ian Waters, North Hero, VT

POLARIS (Radio Shack)
256,018 Michael Popovich, Sr., Nashua, NH
218,450 Allen Roth, Dayton, TX
212,746 Hwan Joo, Weston, Ontario
170,100 Steve Johnson, Santa Ana, CA
151,154 Brian Austin, Rotterdam, NY
139,000 Dave Gilbertz, Griffin, GA
133,538 Brad Rippey, Vienna, VA
113,982 Andy Truesdale, Ferguson, MO
60,000 Cynthia Bruce, Springfield, MO
72,456 Chris Harland, Regina, Saskatchewan
70,482 Brad Widdup, Dundas, Ontario
51,600 Himat Mongia, Atlanta, GA
9hilip Deen, Enterprise, FL ZAXXON (Datasoft) 2,000,000 ☆ Roland Hendel, Mississauga, Ontario 401,900 Mike Hughey, King George, VA 154,000 Ron Rhead, Willowdale, Ontario Hon Knead, Willowdale, Umario Fred Weissman, Brookline, MA William Graspo, New Rochelle, NY Peter Niessen, Carlisle, MA Eric Lund, Millington, NJ Jennifer Klamp, Winter Park, FL Ronald Sperling, Canyon Country, CA 128,000 107,200 83,200 81,400 58,400

FLEX —What is it?

Straight From The Horse's Mouth The Clear Winner



The Original FLEX from Data-Comp

FLEX™ is the "De-Facto" Standard **Disk Operating System** (DOS) for the Motorola 68xx (6800 and 6809) series Computer Chips. FLEX takes care of ALL Disk Operations, relieving the User of the task of keeping up with where Files (Programs) should be stored on the Disk, how much space is left, where it is located, where to go to get a File, etc. Where the Radio Shack Disk System allocates 2 "Granules" per Track on the Disk for Program Storage (meaning that ONLY **TWO** Files can be stored on **EACH** Track, no matter HOW small they are), FLEX allocates Disk Storage by the Sector, which allows up to 18 different Programs, or Files, to be stored on each Track of a Single Sided, Double Density Disk. FLEX also keeps track of which Sectors are available for use, and uses them as needed. For example, you may have had a File that used 4 Sectors, and was then Deleted, leaving these 4 Sectors open. FLEX might use one of them for a File which requires 1 Sector, maybe a couple more for a File that is 2 Sectors long, and then would use the other released Sector for one Sector of Storage for part of a longer File.

released Sector for one Sector of Storage for part of a longer File.

FLEX also provides a "Standard Interface" (or a "Bridge") between different Programs and the different Computer Systems. This allows Software to be written to communicate with FLEX, and then operate on ANY Computer which uses the FLEX DOS. For example, the Program would look to at a specific location in FLEX for a Key from the Keyboard. The type of Keyboard, and how that Key gets to THAT location in FLEX, is of no interest to the Program. Each different Computer System must be "married" to FLEX so that FLEX knows where to get the Key for THAT specific Computer. This allows a Software Writer to design a Program around FLEX, and be compatible with many different Computer Systems.

FLEX is easy to learn and use, with Commands that are straight forward and easy to remember. Commands such as COPY, LIST, DE-LETE, CAT for the Disk CATalog, etc., need little explanation to know what they mean. FLEX also provides "FLEXibility" with most of the Commands; for example, you could enter the Command 'COPY 01', and FLEX would Copy ALL Files from Drive 0 to Drive 1. OR, you could enter 'COPY 0 1 .TXT', and FLEX would Copy all Files WITH A ".TXT" Extension from Drive 0 to Drive 1. You could even enter a Command like 'COPY 0.CAT.CMD 0.CAT1.CMD and Flex would Copy the File CAT.CMD on Drive 0 to a File Named CAT1.CMD, also on Drive 0 (this provides a duplicate of the File CAT.CMD on the Disk; you also have a RENAME.CMD Utility if you just wanted to change the NAME of the File). These are just some examples of the use of the COPY.CMD. You may have noticed that the Filename "Extension" for COPY was not specified in the examples above; FLEX allows you to "ASSIGN" a 'System Drive' and a 'Work Drive' (which CAN be the SAME Drive). FLEX expects you to tell it what to DO first, and THEN what File to USE for that Command. For example, if you have assigned Drive 0 as the System Drive and Drive 1 as the Work Drive; and if you have the File LIST.CMD on the System Drive and the File LET-TER.TXT on the Work Drive; you would enter LIST LETTER and FLEX would look on the System Drive for a Command with the File name of LIST.CMD, load it, and then look for a File named LETTER.TXT (FLEX expects to list a 'TEXT' File) on the Work Drive to LIST. In normal operation, most users use drive 0 as the "System" Drive and Drive 1 as the "Work" Drive. You can override the default File Extensions by providing the Extension; e.g. JUNK.BIN would work if the File had a '.BIN' Extension. If you only have ONE Disk Drive, you can ASSIGN System = 0, Work = 0 with the Command ASN S = 0 W = 0. This discussion is in NO way complete, but is intended to give you an IDEA of how YOU would use FLEX to work with the Disk System.

F-MATE(RS)[™]—What is IT?

Data-Comp, a Division of Computer Publishing Inc., was the FIRST to offer a FLEX Conversion for the Radio Shack Color Computer. Data-Comp was SHIPPING FLEX Conversions which operated on the EX-ATRON Disk Controller about the SAME TIME that the Radio Shack Disk Controller was ANNOUNCED. EXATRON did not follow up with the Double Density Controller, so it faded from the picture. Steve Odneal first developed the 64K RAM Modification that has become the 'Standard' Mod in the Summer of 1981, and began developing the F-MATE(RS) FLEX Conversion Disk Driver Routines for the Radio Shack Disk Controller (he already had a lot of the Keyboard, RS-232, and Display Routines 'roughed out' from the EXATRON Package) in the late summer of 1981 when the FIRST Radio Shack Disk Controllers appeared. The Data-Comp F-MATE(RS) "Updates" have been in the form of ENHANCEMENTS rather than "Bug Repairs", due to the excellent work that Steve has done in developing this Software Package.

The overall goal of the **Data-Comp F-MATE(RS)** FLEX Conversion for the Color Computer has been to keep the System as **STANDARD** as possible. All decisions made during the development of the **F-MATE(RS)** Package were dictated by the operation of the "STANDARD" Business Computer Systems produced by Southwest Technical Products. GIMIX, Helix, etc., with the FLEX DOS. This means that Programs and Files developed with the **Data-Comp F-MATE(RS) FLEX** Conversion will be compatable with these machines, and that the **OP-ERATION** of the **Data-Comp F-MATE(RS)** FLEX Conversion will be the same as you would use should you ever need to Operate one of these Computer Systems, or any OTHER **STANDARD** FLEX Computer System.

The Data-Comp F-MATE(RS) FLEX Conversion Package "marries" the FLEX DOS to the Radio Shack TRS-80C Color Computer™. Due to the unique design of the Color Computer, we are able to control the amount and type of Memory being used by the Computer with Software. Since both FLEX and Radio Shack Disk BASIC want to live in the same Memory, we must turn the Radio Shack ROMs off, and bring RAM up in the upper half of Memory. This also disables the normal Radio Shack Keyboard, Display, Printer, etc., routines, so we had to design our own. Data-Comp was the FIRST to offer the 51 Column by 24 Row Video Display in a FLEX Conversion (I think Cognitec was the FIRST to provide this feature on the Color Computer) to help alleviate one of the real problems in attempting to use the Color Computer for "serious" work. We also provided a "Control Key" and "User Definable" Keys in our Keyboard Routines to provide the full 128 ASCII Character Set; a "Printer Status Check" Routine to allow you an option should you try to use the Printer without it being "Ready" (instead of being forced into hitting RESET and starting all over again); etc.

Data-Comp also LEADS the FIELD in providing the capabilities of USING the FLEX System and some of its power in working with Radio Shack BASIC. We provide two methods of using Radio Shack BASIC while operating under the FLEX DOS; one allows the use of BASIC and EXTENDED BASIC with Tape Only, while the other method provides for the Loading and Saving of Disk Files to a FLEX Disk while using Radio Shack BASIC and EXTENDED BASIC. These capabilities are "nice", but a User soon discovers that he really has a Computer with TWO DIFFERENT Operating Systems; Radio Shack and FLEX. If he wants to run Radio Shack, with it's Graphics and Sound capabilities, he runs RADIO SHACK. If he wants to use the Computer for Business, Software Development, etc., he runs FLEX. The really IMPORTANT UTILITIES THAT THE Data-Comp F-MATE(RS) Package provides is the ability to copy FLEX Disk Files to a Radio Shack Formatted Disk, or copy Radio Shack Disk Files to a FLEX Formatted Disk. This allows you

to develop BASIC or Assembly Language Programs for the Color Computer using the more powerful tools available with FLEX, and then copy them over to a Radio Shack Disk for testing and operation. These Routines allow the transfer of BOTH Text and Binary Files, and ARE NOT provided with other FLEX Conversions!

The Data-Comp F-MATE(RS) FLEX Conversion Package consists of Two Disks (an "INSTALLATION" Disk and a "UTILITIES" Disk) and a Manual. The "INSTALLATION" Disk contains both Radio Shack and FLEX Routines which allow you to develop a FLEX "System" Disk and the file named FLEX.SYS which is loaded any time you insert that Disk and enter the Radio Shack Disk BASIC Command RUN"FLEX". These routines provide the Keyboard, Display, Disk, and RS-232 "Drivers" which marry the FLEX DOS to the Color Computer. They also handle the chore of switching off the Radio Shack ROMs and turning on the required 64K RAM which allows the Color Computer to run the FLEX DOS. When you use the Data-Comp F-MATE(RS) FLEX Conversion package, you do NOT have to rely on the SINGLE, PRO-TECTED, Disk to make a new "System" Disk such as is provided with another conversion; you may make a new System Disk from ANY System Disk that you are using!

The Data-Comp F-MATE(RS) "UTILITIES" Disk provides numerous (at this time, 24) Special Utilities for using FLEX with the Color Computer. Some of these routines have already been mentioned; the FLEX to RS and RS to FLEX Transfer capability, the Enhanced Display Screens, the Printer Status Check, etc. Other major Utilities provided include a Disk Test Utility that also works with Radio Shack Disks (with Source Code) and the capability to use a standard 80x24 External Terminal with the Color Computer when running under FLEX. This Utility also allows the use of a small Hardware Adapter (called the PLUS ONE; price to be announced in the near future) to provide the use of BOTH a Terminal AND a Printer through the Radio Shack RS-232 Connector. Not only that, but there is NO CHANGE in either your operating procedures OR the Commands that you use to use these features. Over half of the Utilities come WITH the Source Code; another feature not found with other FLEX Conversions. (See the listing of the Utilities provided with the Data-Comp F-MATE(RS) Software Package.)

The DATA-COMP FLEX9 Conversion for the Color Computer

Data-Comp decided to go with the "STANDARD" TSC General FLEX9 Package for several reasons. It is a mature and reliable product that should remain fairly stable for a long time; and it is THE STAN-DARD! The Package consists of the FLEX DOS, an excellent Line EDITOR, the Mnemonic ASSEMBLER, and a COMPLETE Set of Manuals. These Software products have been around a while, and are solid, reliable programs. They are also used by the Vast Majority of the 68xx CPU Users. The large majority of Source Code, both Published (primarily in '68' Micro Journal) and supplied with Software Packages (much of which must be assembled before it can be run), is written to be assembled with the TSC Mnemonic Assembler (including the large amount of 6800 Source Code, which can be assembled and run on the 6809 with this Assembler). This is also the Assembler required by many of the Programming Language Packages.

With the COMPLETE "General" 6809 FLEX Package from TSC "as is", the Owner has THE FLEX9 Operating System AND the COM-PLETE Set of Manuals; if Radio Shack should grossly change the Color Computer (Model I - Model III again???), or what ever, all that will be required will be a new set of Drivers (like the Data-Comp F-MATE(RS) Package), and you are again "up and running", with COMPLETE Software compatibility. (NOTE: Since the ROMs are NOT USED with this FLEX Conversion for the Color Computer, Version changes will have NO effect on the operation of the FLEX System.) The "Advanced Programmers Manual" (one of the FIVE Manuals included with the GEN. FLEX Package) becomes more valuable as the User learns more about his System, and is ABSOLUTELY NECESSARY in performing Diagnostics of Disk problems, writing Programs to interface with FLEX,

etc.
This "standardization" is also the reason for the **Data-Comp F**-MATE(RS) Radio Shack to FLEX and FLEX to Radio Shack Disk Conversion routines. There are already too many non-standard systems in the Industry; why add more confusion to the mess. FLEX, the EDI-TOR, and ASSEMBLER, are STANDARDS; they are used by the majority of 68xx Users. The Radio Shack Color Computer BASIC is a STANDARD; it is on every Color Computer produced. If you write a Program for either one of these Systems, you have a large number of Users that can run the Program. We provide the capabilities of developing Radio Shack BASIC or Assembly Language Programs using the MUCH MORE POWERFUL Editor and Assembler running under

FLEX, and then transfer them to a Radio Shack Disk for operation. Radio Shack BASIC is extremely powerful, but is specialized to work with the specific and unique features of the Color Computer. If the User wants to run Radio Shack, with it's Color Graphics and Sound, he can; because it is written for a STANDARD System that ANY Color Computer Owner has. If he wants to use a powerful Business Program, he can do so with the FLEX Disk Operating System; because he has a STAN-DARD System that Thousands of Owners are using.

The Data-Comp F-MATE(RS) FLEX Conversion uses the FLEX Industry Standard Printer Drivers. These are the P.CMD and PRINT-.SYS, along with the Source Code, so you may modify them as required to provide special Drivers. While the Color Computer is restricted right now with the single SERIAL I/O port, it is easy to imagine situations where other Serial and Parallel ports would be added. All that would be required would be to write a different "Printer Driver" to operate these Printers, Voice Modules, EPROM Programmers, etc. (We just finished developing a special set of Drivers which provide Parity for punching a Machine Controller Tape. With the Source Code, you can do the same type of thing should the requirement arise.) With the Printer Driver built in (as is the case with some other conversions), you do not have this flexibility.

Data-Comp uses a special procedure in installing the Bootstrap Loader which maintains as much Radio Shack compatibility as possible. This rountine (the MAKESYS.CMD) CAN be copied to other Disks (and it is suggested that it be kept on ANY System Disk, as the MAKESYS.CMD requires that it be run from a 'System' Disk). The routine changes the FLEX Format of a couple of Tracks on the Disk to Radio Shack Format, and copies a short Radio Shack BASIC Program and the Radio Shack formatted Boot Binary file from the present System Disk to the newly formatted Tracks. The System can then be brought up by simply turning the Computer ON and entering the RS BASIC command RUN"FLEX". If the User does not want to make the Disk a 'System' Disk, he does not need to use this routine, and has several more sectors available for data storage. YOUR choice! Again, FLEXIBLE, only Data-Comp provides this FLEXibility!!

SYSTEM REQUIREMENTS

To run the FLEX DOS, the Color Computer System must consist of the following:

- 1. 64K RAM
- A Disk System (with 1 to 4 Disk Drives)
- The TSC 6809 General FLEX Disk Operating System
- The Data-Comp F-MATE(RS) Color Computer FLEX Conversion Package

The General FLEX Package sells for \$150.00; the F-MATE(RS) Package is \$49.95 if purchased WITH the General FLEX Package, or \$69.95 by itself. Also, contact Data-Comp for up-to-date prices on the 64K RAM Mod Kits and Special Disk Packages for the Color Computer, including the RS Disk Controller, Disk Drives, Cabinets with Power Supplies, etc. (The Data-Comp FLEX Conversion is "comfortable" with Double Sided Disk Drives).

\$200.00 for FLEX ? ? ?

NO, you might consider the Data-Comp FLEX to be FREE! HOW?? Like this:

The COMPLETE Set of FLEX Manuals - available from TSC (or Data-Comp) for \$50.00

The **EDITOR** - available from TSC (or Data-Comp) for \$50.00 (Any GOOD Editor will do, but it is still going to cost around \$50.00) The TSC Mnemonic ASSEMBLER - available from TSC (or Data-Comp) for \$50.00 (This is a NECESSITY if you are going to really USE the FLEX System)

Add them up; \$150.00 for those 3 items that are an INCLUDED part of the TSC 6809 General FLEX Package. You get the FLEX Disk Operating System FOR FREE! AND, it is the PURE, UNADULTERATED, FLEX!

NOW, add up the COST of one of the other FLEX Conversions FLEX "NOW ONLY" \$99 "SPECIAL" \$69.95

PLUS

ED/ASM "only" \$100—and it is NOT THE TSC ASSEMBLER **PLUS**

DBASIC (with a utility to copy RS to FLEX??? What about FLEX to RS!) \$30 (Similar to the Data-Comp CCBASIC.CMD which is a NO COST part of the F-MATE(RS) Package)

PLUS

UTILITIES - A set of specially designed utilities - \$50 (most of which

Data-Comp provides at NO additional cost, and many of Data-Comps utilities INCLUDE the Source Code)

PLUS

? ? ? Well You have ALREADY spent \$250.00 for someone elses UnOriginal FLEX Package.

-NOT TO MENTION-

The others do not provide a "FLEX Adaptation Guide" Manual which explains how to adapt the FLEX System to a Computer System (the Manual that was used as a guideline in developing the F-MATE(RS) Conversion Package), from the others.

The others do not provide Any Source Code for developing special purpose routines if you ever need them, from the others.

The others do not provide Etc. ETC., ETC.!

What you receive with the TSC 6809 General FLEX PACKAGE from Data-Comp

The TSC 6809 General FLEX Package consists of the following items:

- 1. The FLEX9 Disk Operating System (on 2 Disks that are identical)
- 2. The TSC EDITOR
- 3. The TSC ASSEMBLER
- 4. The COMPLETE Set of Manuals, including;
 - a. The "FLEX Users Manual") explains the Commands and Use of FLEX)
 - b. The 6809 FLEX Adaptation Guide" (explains what had to be accomplished with the F-MATE(RS) Software Package)
 - c. The "FLEX Editor" Manual (users Manual for the Editor)
 - d. The "FLEX Assembler" Manual (users Manual for the Assembler)
 - e. The "FLEX Programmers Manual" (information on User Callable Routines, the File Management System, the Structure of a FLEX Disk, etc.)

In other words, the STANDARD Software and Information that you will **NEED** to be able to **USE** the FLEX Disk Operating System. You probably started with a 4 or 16K, Regular BASIC Color Computer. When you upgraded to EXTENDED BASIC, you bought the **Radio Shack** EXTENDED BASIC because you **KNEW** you would have to have **THAT** BASIC to be able to run the "STANDARD" Extended BASIC Programs. The Software Package supplied by **Data-Comp** is the FLEX "STANDARD"; IT is what all of the other FLEX Users are **USING**.

The following Files are included on the 2 General FLEX Disks from TSC:

NOTE: this list was made with the Data-Comp F-MATE(RS) supplied CAT3,CMD and the Gen. FLEX O.CMD

FILES OF DRIVE NUMBER 1

FLEX.COR	ERRORS.SYS	CAT.CMD
COPY.CMD	LIST.CMD	ASN.CMD
DELETE.CMD	RENAME.CMD	TTYSET.CMD
P.CMD	SAVE.CMD	EDIT.CMD
ASMB.CMD	APPEND.CMD	BUILD.CMD
EXEC.CMD	JUMP.CMD	DATE.CMD
O.CMD	LINK.CMD	VERSION.CMD
PROT.CMD	VERIFY.CMD	PRINT.CMD
QCHECK.CMD	I.CMD	XOUT.CMD
SAVE.LOW	PUTLDR.CMD	NEWDISK.TXT
LOADER.TXT	PRINTSYS.TXT	

What you receive with the Data-Comp F-MATE(RS) FLEX Conversion Package

- 1. The F-MATE(RS) Users Manual which contains the Installation Procedures, explains the special features of the F-MATE(RS) Package, discusses the Memory Map, and provides valuable information on User Accessible Routines and Data Areas in the F-MATE(RS) Routines; along with an explanation of each of the F-MATE(RS) Special Utilities in a form that allows them to be removed and inserted in the TSC "FLEX Users Manual" in their proper sequence.
- An "INSTALLATION" Disk which is partially formatted Radio Shack and partially formatted for FLEX. This Disk is used in making up the original FLEX.SYS File for your System Disk.
- 3. A "UTILITIES" Disk which is formatted as a FLEX System Disk (but will not work until you make up the FLEX.SYS File) and contains all of the "Special Utilities" that are unique to the Color Computer FLEX System, MANY of which INCLUDE the Source Code (the .TXT Files in the "UTILITIES" Disk listing).

THE F-MATE(RS) "INSTALLATION" DISK Radio Shack format Files on the Data-Comp F-MATE(RS) INSTALLATION Disk

(NOTE: This list was made up using the Gen. FLEX O.CMD and the Data-Comp supplied F-MATE(RS) RSDIR.CMD to read the Directory of the Radio Shack FORMATTED portion of the Disk)

	DIRECTORY	OF RAI	DIO-SH	ACK D	ISK
FILENAME	/EXT:D	TYPE	Α	GN	BYTE
FLEX	/BAS:1B/	ASPRG		20	00AD
RSBOOT	/BIN:1M	CHPRG		21	0025
FLEXLOAD	/BAS:1BA	ASPRG		22	0035
RSLOADER	/BIN:1M	CHPRG		23	000B
	ENI	D-OF-DIR	ECTOR	₹Y	

FLEX format Files on the Data-Comp F-MATE(RS) INSTALLATION Disk

NOTE: This list was made up using the Gen. FLEX O.CMD and CAT.CMD

CATALOG OF DRIVE NUMBER 1					
DISK: FMATI	ERS #22				
NAME	TYPE	SIZE	PRT		
NEWDISK	.CMD	7			
SDC	.CMD	3			
RSDISKIO	.BIN	4			
RSTERMIO	.BIN	4			
APEND1	.TXT	1			
SECTORS LEFT = 121					

THE F-MATE(RS) "UTILITIES" DISK FLEX format Files on the Data-Comp F-MATE(RS) UTILITIES Disk

	CATALO	G OF DRIVE NU	MBER 1
DISK: FMATI	ERS #22		
NAME	TYPE	SIZE	PRT
V51	.TXT	77	(Source Code)
V51	.CMD	7	
MEMEX	.TXT	31	(Source Code)
CCBASIC	.CMD	4	
DISKEX	.CMD	7	
DISKRATE	.CMD	7	
MAKESYS	.CMD	i	
MEMEX	.CMD	3	
Р	.CMD	2 54	
DISKEX	.TXT	54	(Source Code)
RSDIR	.CMD	2	
SAVEROM	.CMD	2	
USERKEYS	.CMD	2 2 2 23	
V32	.TXT	23	(Source Code)
PRINTSYS	.TXT	9	(Source Code)
P	.TXT	16	(Source Code)
TERM	.CMD	2 3	
RSREAD	.CMD	3	
RSWRITE	.CMD	5	
SDC	.TXT	25	(Source Code)
TESTDISK	.TXT	45	(Source Code)
TERM	.TXT	14	(Source Code)
DISKRATE	.TXT	14	(Source Code)
PRINT	.SYS	1	
NEWDISK	.CMD	7	
RSCVBIN	.CMD	2	
TESTDISK	.CMD	8	
SDC	.CMD	2 8 3 2 3 3	
SEARCH	.CMD	. 2	
CAT2	.CMD	. 3	
CAT3	.CMD		
USERKEYS	.TXT	15	(Source Code)
V32	.CMD	2	
Y	.CMD	1	
N	.CMD	1	
SECTORS LE	FT = 177		

Compare!! A total of **55 Utilities AT NO EXTRA CHARGE** with the **Data-Comp** FLEX Conversion Package (because **WE** know you will **NEED** them very soon, so why charge a little here, a little there, etc.?).

Radio Shack format Files on the Data-Comp F-MATE(RS) UTILITIES Disk

* * * NOTE: These two Files MUST be on ALL System Disks * * * *

They are "installed" when you run the MAKESYS.CMD on a new Disk, a very simple process that is NOT COPY PROTECTED.

DIRECTORY OF RADIO-SHACK DISK

FILENAME

/EXT:D TYPE A GN BYTE /BAS:1BASPRG 20 00AD

FLEX RSBOOT

/BIN:IMCHPRG

20 00AD 21 0025

END-OF-DIRECTORY

SUMMARY

Data-Comp has attempted to provide a Powerful and Complete Disk Operating System with the F-MATE(RS) FLEX Conversion Package for the Color Computer which has a multitude of Working Software available, while holding the "Non-Standard" features and PRICE to a minimum. If you are considering the purchase of the FLEX Operating System, you are "serious" about using the Computer, and will rapidly out grow the "small and non-standard" Editors and Assemblers available with some of the other systems; so why ADD to your overall expense.

We supply the "proven and standard" Software required for a solid "foundation", and when your requirements develop to the point of needing additional Software, you do not have to scrap much of your old Software and procedures, and learn some new Programs, just to continue in your use of the Color Computer.

"the fine print"

FLEX is a Trademark of Technical Systems Consultants, Inc. F-MATE(RS) is a Trademark of Computer Publishing Inc.

DATA-COMP and SOUTHEAST MEDIA SUPPLY

Data-Comp and Southeast Media Supply, both Divisions of Computer Publishing Inc., have numerous items for the Color Computer Systems.

Data-Comp sells and services all of the SS-50 Bus Computer Systems, Disk Systems from 5¼" Floppys through Hard Disk Systems, Printers, etc., through **64K Color Computers** and associated Supplies and Hardware Items. Some examples include:

Complete 64K Color Computer System with One Disk System AND FLEX - \$1079.95

(price subject to change - normally DOWN!)

64K RAM Modification (Chips and Mod. Instructions) - presently \$59.95

Disk System PAK #5 (Radio Shack Color Computer Disk Controller, TWO Double Sided, Double Density Disk Drive with Cabinet and

Power Supplies, Disk Cable; a COMPLETE Dual Disk System using "Thinline" Disk Drives — \$749.95

A Box of 10 Double Density Disketts — \$25.00

Etc., etc., etc.

(These prices and typical examples and are subject to change.)

Southeast Media Supply

Southeast Media Supply handles the SOFTWARE Products, including almost ANY product advertised in '68' Micro Journal. Items that run with the Color Computer FLEX System include Accounting Programs, Data Base Management Programs, Word Processors, Electronic Spreadsheets, Relocating Assemblers, Disassemblers, Pascal, C, and Fortran Compilers, etc., etc., etc.

CALL or WRITE for UP-TO-DATE PRICES and INFORMATION!!

P.O. Box 794

Hixson, Tn. 37343

(615) 842-4601

When ordering call 1-800-338-6800

DATA-COMP has everything you need to make your TRS-80C ° Color Computer WORK for YOU; from Parts and Pieces to Full, Ready To Use SYSTEMS. DATA-COMP designs. sells. services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK FOR YOU!

System Reguirements

FLEX9 Special General Version x Editor & Assembler (which normally sell for \$50.00 ea.) \$150.00 F-MATE(RS) FLEX9 Conversion Rout, for the RS Disk Controller when purchased with Special General FLEX9 Sys. \$49.95 when purchased without the General FLEX9 Sys \$59.95 Set of Eight 64K RAM Chips w Mod. Instructions \$59.95 Color Computer with 64K RAM and EXT. BASIC \$399.95

SPECIAL SYSTEM PACKAGES

64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9, F-MATE(RS) and a Box of 10 Double Density Diskettes: a COMPLETE, ready to run SYSTEM on your Color TV Set. \$1079.95

DISK DRIVE PACKAGES, etc.

These Packages include the Radio Shack Disk Controller, Disk Drives with Pow	er Supply and
Cabinet, and Disk Drive Cable.	
PAK #1 1 Single Sided, Double Density Sys.	\$489.95
PAK #2 2 Single Sided, Double Density Sys.	\$749.95
PAK #3 1 Double Sided, Double Density Sys.	\$569.95
PAK #4 2 Double Sided, Double Density Sys.	\$919.95
PAK #5 — 2 Qume Thinline Double Sided Double Density Sys.	\$749.95
PARTS AND PIECES	
Radio Shack Disk Controller	\$179.95
1 Single Sided, Double Density Disk Drive Tandon	\$249.95
Double Sided, Double Density Disk Drive Quine	\$349.95
1 Qume Thinline Double Sided. Double Density	\$279.95
Screen Clean — Clears Up Video Distortion On Your Color Computer	\$39.95
Single Drive Cabinet with Power Supply	\$89.95
Double Drive Cabinet with Power Supply	\$109.95
Single Drive Disk Cable for RS Controller	\$24.95
Double Drive Disk Cable for RS Controller	\$34.95
Micro Tech Prods., Inc. LOWER CASE ROM Adapter	\$74.95
Radio Shack BASIC Version 1.1 ROM	\$34.95
Radio Shack Extended Basic ROM	\$89.95
= · · ·	JOS. 33

Box 10 Disks 5in. Verbatim - Memorex - 3M \$25 a Box

TERM — AN External Terminal Driver is FREE with purchase of F-Mate

Data-Comp or Southeast Media Supply Call 1-800-338-6800 For Ordering Only!

A Good Program With One Sour Note

As a teacher who works with computers every day, I'm always interested in any new software that has the possibility for use in a classroom setting. As a lover of music, I was especially pleased when the Rainbow sent me Music Drill from Computer Island to evaluate. This program gives the user a chance to practice sightreading of individual notes, as well as giving an audible feedback of the correct sound of that note. It requires 16K and Extended BASIC.

Every profession has its own buzz words, and this program is what computer using teachers call a "drill and practice" program—that is, it provides drill and practice on skills already taught. This is not a "tutorial" type of program that would teach a new skill, so the user must already be somewhat familiar with the musical scale and the placement of notes on the staff. Computers excell at the endless repetition that effective drills need, one reason such programs are so popular with teachers. Good tutorial programs are few and far between. They require careful planning and field testing, and generally require more memory than drill and practice programs. The essential difference between tutorial programs (the teaching of new skills) and drill and practice programs (reinforcement of previously taught skills) should be kept in mind by anyone selecting software for use in the home or school.

Well, now. You have selected Music Drill because you or

INSIM Instruction Simulator

Simulates the complete 6809 instruction set. Use it to quickly debug assembly programs.

Use it to find out how other programs work.

Use it to find out how the basic roms work.

Output to screen or printer.

Includes commands to examine and change memory.

Fven has a mini-disassembler

COMPRESS Reduce basic program size.

Removes spaces and comments.

INTRST1 The interest calculator

Calculates home mortgage payments or any loan payments.

Calculates interest, total interest, total

paid.amount due.

Calculates how much to invest now to retire

in style in 30 years.

This program will calculate future values,

present values and much more!

DEPREC Calculate depreciation using:

Strait line, production unit, working hours,

declining balance, sum-of-the-years digits.

B.C. ENGINEERING

P.O. BOX 768 MANCHESTER, MO. 63011

SEND CHECK OR MONEY ORDER. MO. RESIDENTS ADD 5.625 % SALES TAX.



your kids want a way to practice sightreading of notes, and the association of the sound to its position on the staff. What will you see when you run Music Drill? First, you are asked if you want to practice the bass or treble clefs. Then, you are presented with a menu of the keys available, including a "mixed key" mode that will generate notes from randomly selected keys. When you select the key you wish to work in, the computer draws the staff and plays the scale in that key.

Next, a note is placed on the staff but not played. You then indicate your guess by pressing the appropriate key (a. g, f, d, etc.). If the guess is correct, the computer plays the note and places another one on the screen. If the guess is incorrect, the computer gives an obnoxious sound and another chance to guess. After the third incorrect guess, the computer displays the correct answer, the screen clears, and the same note is placed on the screen. This routine is repeated until you press the correct key. (The "stalling" of the program until the user makes the correct response is a sound educational practice, and one I wish would be incorporated into more software intended for classroom or instructional use.)

After 10 notes, the computer displays the time you took to complete the round, and the number of notes you guessed

The graphics in this program are nicely done. The clefs are pleasingly and correctly shaped, and the notes appear where they should. The sounds generated are as close as the computer can get to the true note (which, in nearly all cases, is pretty close). The documentation, though, is skimpy, both in size (a 3.5" by 4.5" sheet of paper stapled to the inside of a paper folder) and content, but does give the essentials to run the program. This program comes on cassette (which loaded correctly every time I used it) and is written in BASIC.

My one complaint has to do with the scoring. After the third incorrect guess, the computer displays the correct answer, clears the screen, and places the same note on the screen. If the user presses the correct key (remember, they have just seen the answer), that is counted as a correct guess of a new note. Thus, in a round of 10 notes, the user could miss all the notes the first time they are presented (after three guesses), and still receive a score of five out of 10 "correct" guesses, since each round of guesses is considered as a new

I feel sure the reason behind this is that the people at Computer Island did not want someone to feel a complete failure, even if they were just beginning to learn music, but the lowest possible score is five out of ten, even if all the notes are missed on the first try. The score report is worded _minute(s) of drill, you guessed ____ notes correctly on the first try." Now, the user may have guessed some of those correctly on the first try, or all of them; or all of those "correct" guesses may have been on the second round (that is, after three incorrect guesses and a look at the correct answer). There is no way to know from the score report.

As it stands, this program can be used for effective drill and practice in the home, but an improved score report (perhaps indicating the number of correct guesses on the first, second, and third tries) would make this program a good bet for classroom use as well.

With the one reservation about scoring, I would recommend this program.

(Computer Island, Dept. R, 227 Hampton Green, Staten Island, NY 10312, \$19.95 on tape)

-Mark Williams

CoCo Warehouse

NOW THE BEST IS EVEN BETTER! MASTER CONTROL II

from Soft Sector Marketing

The best doesn't always cost more and MASTER CONTROL is a good example. What would you be willing to pay for a program that would cut your typing time by more than 50% and eliminate hours of debugging because you misspelled a command word? For example the command STRINGS (requires nine strokes, with MASTER CONTROL II you only require two strokes. Just hit the down arrow key twice and it's done, and no mistakes. That is just one of the 50 pre-programmed commands available to you. If that isn't enough you also have the ability to customize your own key to enter a statement or command, correctly, automatically every time. But thats not all, how about automatic line numbering. Just enter the starting number and the increment you want and MASTER CONTROL II will do it for you. You also have direct control of MOTOR, AUDIO and TRACE plus a direct RUN key. Sounds great? Well thousand of color computer owners have been enjoying these features for years. But now the new MASTER CONTROL II also has the following features:

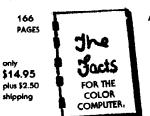
- New plastic overlay that can be removed when you are not using MASTER CONTROL II.
- New documentation, to help you get the most from the program.
- New repeating keyboard.
- New-now loads to disk with appropriate disk commands.

List price \$19.95

Introductory price $^{\$}17^{88}$

Plus \$2.50 Shipping & Handling

SAVE A BUCK...Order the NANOS Color Basic and Extend pocket card with your MASTER CONTROL II and you get this \$4.95 value for only \$3.95 extra. (NANOS pocket card not sold separately.)



A MUST BOOK for the Color computer owner! • Schematics

> Spec Sheets

ORDER YOUR COPY TODAY!

The first document to provide information that will allow the user to take advantage of all the features of the Color Computer. Aimed at the machine language user.

The FACTS attempts to explain, and describes in detail, how the user can make use of the computers internal features. Divided into two sections: Hardware and software; the primary emphasis is on hardware capabilities and circuits. Provides detailed explanations of all the internal large scale integrated circuits.

SPECIALS DONKEY KING

by Tom Mix Software

Exciting sound-Realistic graphics. Never before have you seen a game like this for your CoCo. Four graphic screens just like the actual arcade games.

Requires 32K

TAPE...\$19.95

IF YOU DON'T HAVE 32K ORDER THE RAM SLAM. THIS SIMPLE KIT TO UPGRADE YOUR COCO TAKES LESS THAN 30 MINUTES TO INSTALL. NO SOLDERING REQUIRED...

only \$49.95

KEYS of the WIZARD

By Spectral Associates

Keys of the Wizard is a fastaction, Machine language adventure game filled with tricks, traps, treasures and creatures all of which are randomized at the beginning of each adventure so that no adventure will ever be exactly the same. Three different skill levels to choose from. Cassette only.

Reg. \$19.95 \$16.95

MAGIC BOX

By Spectral Associates

Magic Box is a special purpose utility designed to load TRS-80 Model I and III 50 Baud Basic programs into the Color Computer. Makes available a wide selection of software. Magic Box DOES NOT convert Machine language programs. Requires 16K Extended BASIC.

Reg. \$24.95 **\$21.95**

DOODLE BUG

by Computerware

You must hustle your lady bug through an intricate maze of barriers and turnstiles, while trying to earn points by eating all the dots, letters and hearts. Enemy bugs buzz after you and you must avoid the skulls! Exquisite sound adds to the excitement. A must game for anyone who enjoys fun and a challenge.

Cassette...\$21.21



WRITE FOR OUR CATALOG
SEND ORDERS TO

500 N. Dobson ● Westland, MI 48185 Phone (313) 722-7957

ARCADE GAMES

GHOST GOBBLER by Spectral Associates This is an excellent version of the popular arcade game of PAC-MAN. You control maze with the right joystick. Requires Extended BASIC.

Shield your castle from cannonball attacks and deflect them towards your opponent's castle. Machine language, Ext. BASIC. Requires joysticks.

Cassette only \$19.95

HAYWIRE by Mark Data

Have fun zapping robots with fast paced action combined with dynamite sound effects and super Hi-Res graphics. For one or two players.

Cassette only \$24.95

GALAX ATTAX by Spectral Associates Under a constant barrage of enemy fire you protect your ground base by shooting alien fighters. Use the right joystick to control the motion of your ship and right fire button to fire.

Cassette only \$21.95

CAVE HUNTER by Mark Data Products Fast-paced action for the Color Computer. Super Hi-Res graphics, dynamite sound effects. This game will astonish you with its detail and quality.

Cassette only \$24.95

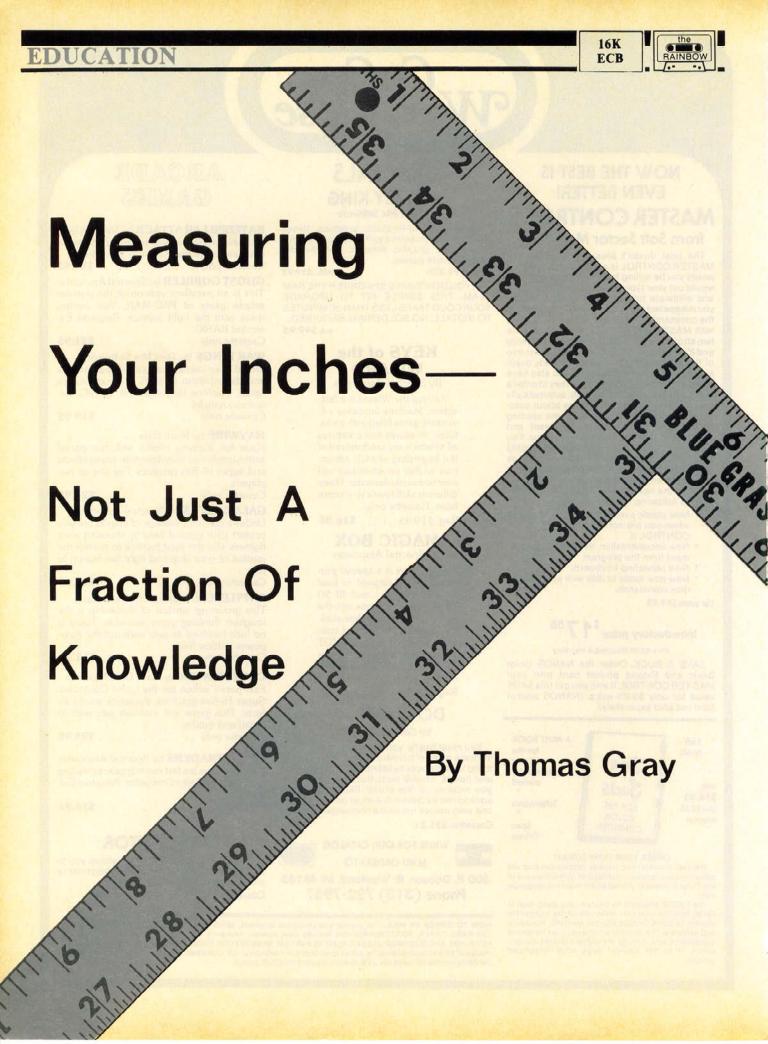
SPACE TRADERS by Spectral Associates Space Traders is a fast moving galactic trading game for the Color Computer. Requires Ext.

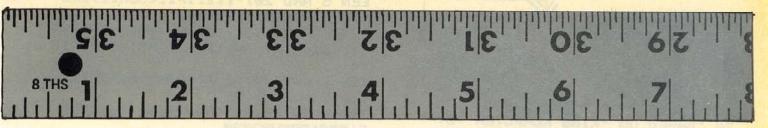
TYPING TUTOR

This personal typing teacher allows you to learn at your own pace whether a beginner or just a little rusty. 16K

Cassette...\$19.95

HOW TO ORDER BY MAIL: For prompt and courteous shipment, SEND MONEY ORDER, CERTIFIED CHECK, CASHIERS CHECK, MASTERCARD/VISA (include card number, inter-bank No., expiration date and signature) PERSONAL AND BUSINESS CHECKS MUST CLEAR OUR BANK BEFORE PROCESSING. Shipping and packaging charge of \$2.50 minimum must be added to all orders in continental U.S. (Canadian order \$5.00 minimum) Michigan residents include 4% sales tax 10% deposit required on C.O.D. orders.



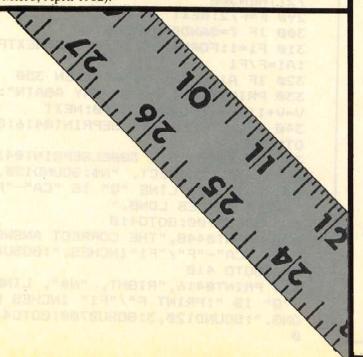


Reader was intended not to teach but to reinforce the skill of measuring to the nearest eighth of an inch. The program, using low-res graphics, draws a ruler and a colored line to be measured, then asks the student to input the number of whole inches and lowest-terms fraction of an inch. There is a graphics diversion after every three questions. This interim reward encourages students to continue, while successful ruler readers get a more extensive graphics "reward" at the end of the program.

Don't plunk your children or students in front of the computer and expect great things, though. The program assumes previous experience with both linear measurement and fractions. After reviewing these concepts, I introduce the program on a classroom monitor and explain its use. I pretend that the TV screen is a "window" over a yardstick. The yardstick extends to the left and right; the line to be measured also extends to the left, out of sight. If necessary, I demonstrate this with a 12-inch ruler and a piece of construction paper with a 2 x 3 inch horizontal rectangle cut out. After they have seen a number of examples on the screen, most students catch on. There is a sample question in the program for review.

Once the instruction is finished, the computer handles the individual drill and practice essential to measurement skills. The computer is no substitute for hands-on activity, but it does help, and the ruler program gives me good results in terms of student interest and performance.

The basic format and fraction manipulation in Ruler Reader are adapted from a program by D. B. Allison (80 Micro, April 1982).



Outline

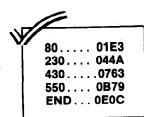
Line	Function
30-70	Introduction
80	Sets values for sample
90	Begin main program
100-160	Set values for each question
180-220	Whole inch routine
230-340	Fraction routine
350-390	Report on line length
410	Increment score
440-460	Report score, offer replay
470-540	Sample question
700	Delay for student response
800	Graphics diversion after three questions
1000-1070	Draw ruler
5000	Graphics reward at end

Variable List

n\$	name of student
A\$	choose sample
K	random length of line to be measured
K1	adjusts line to ruler
Q C2	question number being worked
C2	ruler color
Cl	line color
N	first number on ruler
ZZ	total number of questions
GH	marker for fraction reduction bypass (avoid
	division by zero if fraction happens to b
	EG three whole inches)
F	fractional remainder of line
T	number of tries at inches
V	number of tries at fraction
CA	correct answer in inches
A	student input of whole inches; also variable in
	fraction reduction
W	delay counter
A\$	student input of fraction
L1,L,L\$	A STATE OF THE STA
R,R\$	variables in manipulation of fractions
F	reduced numerator
F1	reduced denominator
Z	exponent counter in fraction reduction
NR	number right
AV	percent correct
Y\$	response to replay demand
M	memory location in graphics diversion
C,B	value of character poked to memory

S,T

randomization factors in graphics diversion



The listing:

10 RULER READER BY T. GRAY 20 'BASED ON "KING KOMPUTER" BY D.B. ALLISON, 80 MICRO, APR. 82 30 CLS:PRINT@66, "CAN YOU READ AN LET'S FIN INCH RULER? "!TUO a 40 PRINT:PRINT"THE RULER WE WILL USE IS LARGER THAN NORMAL. S MAKES IT EASYTO READ, BUT I CA N ONLY SHOW A BIT OF IT AT A TI ME. 50 PRINT: INPUT TYPE YOUR NAME AN D PRESS <ENTER>"; N\$ 60 CLS:PRINT@128, "OKAY, "N\$", D A SAMPLE QU O YOU WANT ESTION?" 70 INPUT"TYPE Y OR N AND <ENTER> "; A\$: IFA\$<>"Y"THEN9Ø 8Ø K1=21:Q=Ø:C1=8:C2=4:N=1:GOTO1 90 CLS: INPUT"OKAY, LET'S START N

CONVERT YOUR PICTURES COPY INTO HARD

HOW MANY QUESTIONS

CATCH THAT COLOR PMODE3 (USING PICTURE ON PAPER

CGP-115 COLOR PLOTTER)

- · Machine language subroutines for speed
- · Auto start from cassette
- · Works with Micro Painter
- ·Will print pictures from cassette
- · Includes sample picture -American Flag

Just \$14.95 plus \$1.50 postage and handling

To: All-American Ultralight Industries/ (AUI) 1144 Kingston Ln. Ventura, Calif. 93001

DO YOU WANT? (PICK A NUMBER BETW EEN 5 AND 20)"; ZZ: IFZZ<50RZZ>200 RZZ<>INT(ZZ)THEN9Ø 100 FOR Q=1TOZZ:N=RND(10) 110 C2=4:C1=RND(7)+1:IFC1=4THEN1 120 K=RND(24): IFN>1ANDK<8THEN120 13Ø K1=2*K+1 14Ø CLSØ:PRINT"QUESTION "Q;:GOSU B1000:GOSUB2020 15Ø GH=Ø 160 IN=INT(K/8):F=K-IN*8:T=Ø:V=Ø :CA=N-1+IN 17Ø IF Q=ØTHEN47Ø 18Ø PRINT@32Ø, "HOW MANY WHOLE IN CHES": INPUTA 190 IF A=CA THEN PRINT@352, "THAT 'S RIGHT, ";N\$:FORW=1T0600:NEXTW :GOTO 23Ø 200 PRINT@384, "NOPE--TRY AGAIN." :FORW=1T06ØØ:NEXT:PRINT@384," 210 T=T+1: IFT<3THEN180

22Ø PRINT@352, "THE ANSWER IS "C A" INCHES." 23Ø PRINT@352: INPUT"WHAT FRACTIO N OF AN INCH IS LEFT"; A\$: IFVAL (A \$) =ØTHENA=Ø: GOTO27Ø 240 L1=LEN(A\$):IFL1<>3THEN270ELS 250 Ls=LEFT\$(A\$,L):R\$=RIGHT\$(A\$, R): A3=VAL(L\$): A4=VAL(R\$): IFA4=Ø THENA-3ELSEA-A3/A4: IFA4>80RA4<2T HEN A=3 26Ø IF MID\$(A\$,L+1,1)<>"/"THENA= 27Ø IFGH=1THEN 32Ø

28Ø FORZ=3TO1STEP-1: IFF/2<>INT(F /2) THEN3ØØ 29Ø F=F/2:NEXT Z

300 IF Z=0ANDA=0THEN390

310 F1=1:FORP=1TOZ:F1=F1*2:NEXTP :A1=F/F1

320 IF A1=A AND F1=A4 THEN 350 330 PRINT@416, "NOPE--TRY AGAIN": V=V+1:GH=1:FORW=1TO7ØØ:NEXT

34Ø IFV=3THEN 37ØELSEPRINT@416:G OT023Ø

350 IF IN=0 THEN 380ELSEPRINT@41 6, "THAT'S CORRECT, "N\$: SOUND120, 3:PRINT@448, "LINE "Q" IS "CA"-"F "/"F1" INCHES LONG."

36Ø GOSUB7ØØ:GOTO41Ø

370 PRINT@448, "THE CORRECT ANSWE R IS "CA"-"F"/"F1"INCHES.":GOSUB 700:GOTO 410

38Ø PRINT@416, "RIGHT, "N\$", LINE "Q" IS ":PRINT F"/"F1" INCHES L ONG. ": SOUND120, 3: GOSUB700: GOTO41 Ø

READ THE FINE PRINT. It's worth your time. This is good stuff.

SYSTEMS SOFTWARE

MACRO-80C

This is a disk-based editor, macro assembler and monitor, written for Color Computer by Andy Phelps. THIS IS IT — The ultimate programming tool!

The powerful 2-pass macro assembler features conditional assembly, local labels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard source format. There are no changes, constraints or shortcuts in the source language definition. Incorporating all of the features of our Rompack-based assembler (SDS80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility.

The screen-oriented text editor is designed for efficient and easy editing of assembly language programs. The "Help Key" feature makes it simple and fun to learn to use the editor. As the editor requires no line numbers, you can use the arrow keys to position the cursor anywhere in the file. MACRO-80C allows global changes and moving/copying blocks of text. You can edit lines of assembly source which are longer than 32 characters.

DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, etc.

The editor, assembler and monitor — as well as sample programs — come on one Radio Shack compatible disk. Extensive documentation included. MACRO-80C Price: \$99.95

SOFTWARE DEVELOPMENT SYSTEM

The Micro Works Software Development System (SDS80C) is a complete 6809 editor, assembler and monitor package contained in one Color Computer program pack! Vastly superior to RAM-based assemblers/editors, the SDS80C is non-volatile, meaning that if your application program bombs, it can't destroy your editor/assembler. Plus it leaves almost all of 16K or 32K RAM free for your program. Since all three programs, editor, assembler and monitor are co-resident, we eliminate tedious program loading when going back and forth from editing to assembly and debugging!

The powerful screen-oriented Editor features finds, changes, moves, copys and much more. All keys have convenient auto repeat (typamatic), and since no line numbers are required, the full width of the screen may be used to generate well commented code.

The Assembler features all of the following: complete 6809 instruction set; conditional assembly; local labels; assembly to cassette tape or to memory; listing to screen or printer; and mnemonic error codes instead of numbers.

The versatile monitor is tailored for debugging programs generated by the Assembler and Editor. It features examine/change of memory or registers, cas sette load and save, breakpoints and more. SDS80C Price: \$89.95

MICRO WORKS COLOR FORTH

- Forth is faster to program in than Basic
 - Forth is easier to learn than Assembly Language Forth executes in less time than Basic

Forth is a highly interactive language like Basic, with structure like Pascal and execution speed close to that of Assembly Language. The Micro Works Color Forth is a Rompack containing everything you need to run Forth on your Color Computer.

Color Forth consists of the standard FORTH Interest Group (FIG) implementation of the language plus

most of FORTH-79. It has a super screen editor with split screen display. Mass storage is on cassette. Color Forth also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. Color Forth contains 10K of ROM, leaving your RAM for your programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound. The 112-page manual includes a glossary of the system-specific words, a full standard FIG glossary and complete source listing. COLOR FORTH ... THE BEST! From the leader in Forth, Talbot Microsystems. Price: \$109.95

MICROTEXT: COMMUNICATIONS VIA YOUR MODEM!

Make your Color Computer an intelligent printing terminal with off-line storage! The Microtext module is just what you'll need for:

- Talking to a timeshare system or information service
- Printing out what is received as it is received
- Saving received text to cassette tape
- Re-displaying the received text even while
- Communications with other computers
- Using your computer as a general-purpose 300-baud terminal
- Downloading programs from other computers

The Microtext module is a program pack containing not only firmware but a second serial port so that both your printer and modem can be connected at the same time. Microtext can be configured for any serial printer that will work with the Color Computer, even if it requires line feeds! But even if you don't have a printer, you can keep a permanent copy of your data by storing to cassette tape. Also, any Radio Shack/ Centronics-compatible parallel printer may be used by adding the Micro Works' PI80C parallel interface.

For those of you with special terminal applications, Microtext has selectable parity; it sends odd, even, mark or space With mark parity (which is default) you can send to computers requiring either seven or eight bits. All 128 ASCII codes can be sent. Exchange programs with other Color Computer users! Basic programs may be downloaded from other computers or timesharing systems.

You'll find many uses for this versatile module! Available in ROMPACK, ready-to-use, for \$59.95.

MACHINE LANGUAGE

MONITOR TAPE: A cassette tape which allows you to directly access memory, I/O and registers with a formatted hex display. Great for machine language programming, debugging and learning. It can also send/receive RS232 at up to 9600 baud, including host system download/upload. 19 commands in all. Relocatable and reentrant, CBUG Tape Price: \$29.95

MONITOR ROM: The same program as above, supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to re-load the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or the Romless Pak I. CBUG ROM Price: \$39.95

SOURCE GENERATOR: This package is a disassembler which runs on the color computer and generates your own source listing of the BASIC interpreter ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, I/O hardware details and more. A 16K system is required for the use of this cassette. 80C Disassembler Price: \$49.95

BOOKS

6809 Assembly Language Programming, by Lance Leventhal, \$16.95

TRS-80 Color Computer Graphics, by Don Inman, \$14.95

Assembly Language Graphics for the TRS-80 Color Computer, by Don Inman, \$14.95

Starting Forth, by L. Brodie, \$19.95

GAMES

Star Blaster — Blast your way through an asteroid field in this action-packed Hi-Res graphics game, Available in ROMPACK; requires 16K. Price: \$39.95

Pac Attack — Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. Price: \$24,95

Haywire — Have fun zapping robots with this HI-Res game by Mark Data Products. Cassette requires 16K.

Dunkey Munkey — Arcade excitement awaits those who dare to conquer the Munkey! Joystick and 32K required, by Intellectronics. Cassette: \$24.95

Colorpede — Great graphics, two-player option, and pause control in this exciting game by Intracolor Communication. Cassette requires 16K: \$29.95

Adventure . - Black Sanctum and Calixto Island by Mark Data Products. Each cassette requires 16K:

Cave Hunter - Experience vivid colors, bizarre sounds and eerie creatures in hot pursuit as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. \$24.95

Starfire — Fly around the planet defending Earthlings from being snatched up by allens in this challenging game from Intellectronics. Cassette requires 16K:

Doodle Bug — Joystick-controlled Doodle Bugs must move quickly through mazes while being chased by enemy bugs in Hi-Res game by Computerware. Cassette requires 16K: \$24.95

Astro Blast -- You'll need to act fast as you protect Earth from wave after wave of alien invaders in this Hi-Res game by Mark Data. Cassette requires 16K;

HARDWARE

PARALLEL PRINTER INTERFACE — Serial to parallel converter allows use of all standard parallel printers. PI80C plugs into the serial output port, leaving your Rompack slot free. You supply the printer cable. PI80C

MEMORY UPGRADE KITS: Consisting of 4116 200ns., integrated circuits, with instructions for installation. 4K-16K Kit Price: \$39.95. 16K-32K Kit (requires soldering experience) Price: \$39.95. For Rev. level E, ET, NC and TDP-100s, we carry 64K chips; upgrading is easy! Eight prime 64K chips and instructions: \$64.95

Romless Packs for your custom EPROMs - call or write for information.



MasterCharge/Visa Accepted California residents add 6% tax. 390 PRINT@416, "RIGHT, "N\$".":IF CA=1THENPRINT"LINE "Q" IS ONE IN CH LONG" ELSE PRINT"LINE "Q" IS "CA"INCHES LONG.":SOUND120,3

410 IFV=ØANDT=ØTHEN NR=NR+1

42Ø IF Q/3=INT(Q/3)THENGOSUB8ØØ

43Ø NEXT Q

44Ø CLS:AV=INT((NR/ZZ)*100):PRIN Te16Ø,"YOU GOT ";NR;"RIGHT OUT O F ";ZZ" FOR A SCORE OF ";AV;" PE RCENT.":FORW=1TO8ØØ:NEXTW:IFAV=1 ØØTHENPRINT"YOU DID VERY WELL. W ATCH THIS!":FORW=1TO8ØØ:NEXTW:GO SUB5ØØØ

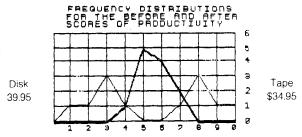
45Ø CLS:PRINT@128, "WANT TO GO AG AIN? TYPE Y OR N AND <ENTER>": INPUTY\$:IFY\$="Y"THEN NR=Ø:GOTO6Ø 46Ø CLS:PRINT"OKAY, "N\$". I HOPE YOU ENJOYED THE GAME

. ": END

470 PRINT@64, "EACH QUESTION WILL BE LIKE THIS";:PRINT@320, "HOW M ANY WHOLE INCHES?":INPUTA:IFA=1T HENPRINT"THAT'S RIGHT, "N\$", " 480 PRINT"IN THIS QUESTION THE A NSWER IS 1":FORS=64 TO 94:PRINT@ S.CHR\$(128):NEXTS:GOSUB700

STATISTICAL ANALYSIS PACKAGE

Two programs to handle all your data organization, display and analysis needs! First program provides 1. List of Data; 2. Before & After Totals; 3. Averages; 4. Data Displayed in Bar Graph Form; 5. Frequency Distributions (With Graphic Display). Graph of Frequency Distribution even allows you to input 4 lines of text on graphic screen before printout!



Second program provides Analysis of Variance between treatment and control groups. Each step in calculation is displayed (raw scores, delta scores, deltas squared, grand square, SSB, SSW and "F" number). Program then tells you if variance is significant and, if so, which group showed improvement, Printer Output Option. 32KEXT

Include \$1.50 for handling for each program.

Az. Residents add 6% Sales Tax.

IPETROCCI FREELANCE ASSOCIATES

651 N. Houghton Rd.

Tucson, AZ. 85748

602-296-1041

49Ø FORX=32ØTO415:PRINT@X," ":NE XT:PRINT@32Ø,"WHAT FRACTION IS LEFT? **(USE LOWEST** INCH TERMS).": INPUTA\$ 500 FORX=320TO415:PRINT@X." ":NE XT:PRINT@320, "REMEMBER, 2/8 AND IN LOWEST TERMS.": 4/8 ARE NOT PRINT@384, "THE ANSWER IS 1/4 INC H. ": IFA\$="1/4"THENPRINT@416, "SO YOU WERE RIGHT." 51Ø PRINT"THE LINE IS 1-1/4 INCH ES LONG." 520 GOSUB700 530 GOSUB 800:PRINT@64,"IF YOU G IVE A WRONG ANSWER, I WILL TEL YOU WILL HAVE 3 CHANCES L YOU. AT EACH PART. AFTER THETHIRD TR Y I WILL TELL YOU THE CORRECT ANSWER." 540 PRINT: INPUT"DO YOU WANT TO S EE THE EXAMPLE AGAIN? TYPE Y OR N AND <ENTER>"; A\$: IFA\$="Y"THEN8 ØELSE9Ø 55Ø END 700 PRINT@15, "PRESS <ENTER>":PRI NT@47, "TO CONTINUE": A\$=INKEY\$ 71Ø IF INKEY\$=""THEN71Ø 72Ø RETURN 800 GR=RND(128)+127:FORW=1024T01 535: POKEW, GR: NEXT: CLSØ: RETURN 1000 'DRAW RULER 1010 FOR X=17TO63STEP16:A=5:GOSU B2000:NEXT: ***INCH MARKERS 1020 FORX=9T063STEP16:A=3:GOSUB2 ØØØ:NEXT: *** 1/2 INCH MARKERS 1030 FORX=5T063STEP8:A=2:GOSUB20 ØØ:NEXT: '***1/4 INCH MARKERS 1040 FORX=3TO63STEP4:A=1:GOSUB20 ØØ:NEXT: ***1/8 INCH MARKERS 1Ø5Ø Y=9:GOSUB2Ø1Ø:Y=17:GOSUB2Ø1 1060 PRINT@229,N;:PRINT@237,N+1; :PRINT@245,N+2; 1070 IF N=1THENX=1:A=7:GOSUB2000 1080 RETURN 2000 FORY=10T010+A:SET(X,Y,C2):N EXTY: RETURN: 2010 FORX=1T063:SET(X,Y,C2):NEXT : RETURN 2020 FORX=ITOK1:SET(X,7,C1):NEXT : RETURN 5000 'GRAPHICS REWARD 5010 CLS0:FOR T=1TORND(7)+3:C=RN D(128)+127:B=RND(128)+127:S=RND(3) 5020 FOR M=1024TO1535STEPS:POKEM , C: POKEM+1, B: NEXTM, T

5030 C=128:FORM=1024T01535:POKEM

, C: NEXT

5040 RETURN

REALLY SAVE!!!

SUPER SPECIALS

THESE SPECIAL VALUES ARE AVAILABLE THROUGH SEPTEMBER 15, 1983

		•	
LANCER 32K (SPECTRAL ASSOC.)		OMNI CLONE (P.P.) DISK 32K	31.95
ADV. IN WONDERLAND (P.P.)	19.95	DISK ZAPPER (P.P.) 64K	27.95
TRAPFALL (MIX)	22.35	64K RAMS	44.95
TEEEOFFF (P.P.)	19.95	LCA 47 LOWER CASE ADAPTOR	59.95
ZAXXON (DATASOFT) 32K		R/S DISK INTERFACE (w/case)	139.95

GAMES

UAME:	7	
	TAPE	DISK
TOM MIX - 15% OFF		
GRABBER 32K	23.75	N/A
THE FROG		N/A **
THE KING 32K	21.55	**
PROTECTORS	. 21.20	**
	21.20	
COMPUTERWARE — 15% OFF		
SYNTHER 7	18.65	**
PAC ATTACK II (NEW!)	. 21.20	**
MOON HOPPER (NEW!) 32K		**
DOODLEBUG		**
GRAN PRIX (NEW!) 32K	18.65	**
NERBLE FORCE (NEW!)	21.20	**
PRICKLY PEAR 20% OFF		
FLIGHT 32K	15.95	19.95
GANGBUSTERS (DISK IS 32K)	15.95	19.95
SHAFT (DISK IS 32K)		23.95
MUSIC BOX	19.95	N/A
DETROCCI EDEELANCE CON		
PETROCCI FREELANCE — 20%		
INSPECTOR CLUESEAU 32K	16.95	
SPECTRAL ASSOCIATES — 150	V 0FF	
WHIRLYBIRD RUN	18.65	**
LUNAR ROVER PATROL		**
MS. GOBBLER 32K	. 18.65	**
COLORQUEST — 15% OFF		
BEYOND THE CIMEON MOON (DISK IS 32K)		25.45
MS NIBBLER	16.95	21.20
FEMBOTS REVENGE (DISK IS 32K)	25.45	29.70
, ,		25.45
BUSINESS & UT	ILITI	ES
NELSON SOFTWARE — 15% OF		
	. •	=.=
TAPE	ROMPK	DISK
SUPER COLOR WRITER 3.0 59.45	76.45	84.95

SUPER COLOR TERMINAL 42.45

CALL FOR AVAILABILITY OF CALC & DATABASE

SUPER COLOR SPELLER

SUPER COLOR CALC

SUPER COLOR DATABASE

SUPER COLOR DISK-ZAP

PRICKLY PEAR — 20% OFF	TAPE	DISK
		00.05
DISK MANAGER	N/A	23.95
DISK MASTER	N/A	19.95
MAILING LIST 32K	N/A	39.95
DISK PROGRAMS ON AMDEK CARTRIDGES, A	DU \$5.00	
SILICON RAINBOW		
COLOR 80 BBS PACKAGE	N/A	115.00
RTD BBS & REMOTE TERMINAL DRIVER —		
USE A REMOTE TERMINAL OR SET UP		
YOUR OWN BBS — THIS IS A GREAT		
M/L PROGRAM	30.00	N/A
SUPER DISK UTILITY	N/A	30.00
SOFT SECTOR MARKETING - 159	% OFF	
MASTER CONTROL II	16.95	N/A
COMPUTERWARE — 15% OFF		
64K SCREEN EXPANDER - 64K	21.20	25.45
RANDOM BASIC (FLEX) - 64K	N/A	63.75
COLOR ASSEMBLER - 32K	21.20	N/A
COLOR EDITOR - 32K	21.20	25.45
COLOR MONITOR - 32K	21.20	25.45
DISK MACRO ASSEMBLER & XREF - 32K	N/A	42.45
MICRO WORKS — 10% OFF		
MACRO 80C-EDITOR, ASSEMBLER AND		
MONITOR, THIS ONE'S THE STANDARD	N/A	89.95
SKYLINE SOFTWARE—15% OFF		
PAGE PLUS 64K	23.75	25.45
M DISK 64K	23.75	25.45
64K BOOT PAGER	16.95	N/A
STRUCTURED MACROS	N/A	16.95
MICRO TECHNICAL PRODUCTS -	15% ()FF
ROML	21.25	24.65
PLUS 32K	12.75	16.15
ROMKIL	12.75	16.15
BANNER	16.15	19.55
NANOS CARD OR R/S REFERENCE GUIDE — 9	•	13.33
ONE FREE WITH ORDER OF \$150.00 OR MORE	9 4 .UU	
ONE THEE WITH ORDER OF \$100.00 OR MORE		

HARDWARE VALUES

DRIVE O — \$ CALL
CASSETTES W/HARD BOX — \$12.00 per dozen

DISK CABLES

	2 DHIVES	4 DHIVE
STANDARD CONTACTS	24.95	34.95
GOLD CONTACTS	34.95	44.95
COCO SWITCH — 3 WAY RS-232		
SWITCHER. A QUALITY SWITCH		
FOR YOUR COCO	29.95	

BACK TO SCHOOL SPECIALS

	IAPE	DISK
TELEWRITER 64 (COGNITEC)	39.95	47.95
ELITE CALC (ELITE)	35.95	35.95
FLEXIFILER (CW) (NOT A FLEX PGM) 32K	N/A	51.95
FLEX (FHL) 64K	N/A	59.45
FORTH (STEARN) 32K	47.15	N/A
PASCAL (CW) 32K	39.95	47.95
PASCAL W/COLOR EDITOR (CW) 32K	N/A	63.95
RMS-FLEX 64K	N/A	170.00

BARGAIN BASEMENT!!!! SAVE 40%

	TAPE	DISK
COLOR INVADERS	11.97	14.97
STORM	14.97	17.97
RAIL RUNNER	14.97	17.97
COLOR CONNECTION	17.97	23.97
STARSHIP CHAMELEON	14.97	17.97

24 HOUR ORDER LINE (602) 839-8233

50.95

N/A

76.45 N/A

N/A

N/A

N/A

N/A

N/A

59.45

59.45

67.95

42.45

375.75

(LIVE ANSWER 7-10 p.m. PDT and weekends)

24 HOUR BBS (602) **245-0488**

**DISK VERSIONS OF THESE GAMES ARE SPECIAL ORDER — CALL!

PRICES & AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE

TO ORDER:

WE ACCEPT PERSONAL CHECKS (2 WEEKS CLEARANCE TIME PLEASE), MONEY ORDERS, AND COD. PLEASE INCLUDE \$2.00 FOR POSTAGE AND HANDLING. COD IS AN ADDITIONAL \$3.00. ARIZONA RESIDENTS ADD 6% SALES TAX. SEND TO:

ARIZONA DISCOUNT SOFTWARE

1110 S. ALMA SCHOOL RD., #5159 ● MESA, ARIZONA 85202 PHONE (602) 839-8233 COMPUSERVE ID # 71545,1236

The Tooth Of Time Byte By Byte

It's a real pleasure to see more educational programs becoming available for the CoCo. Unfortunately, many of these are either poorly written programs or are simply poor learning experiences. However, Crystal Software has put together a program that succeeds on both counts. With five modes, six skill levels, hi-res graphics and sound, *Time Teacher* is designed to teach young children how to tell time.

A menu gives a choice of five modes. The first is a display mode showing both a traditional clock face and a digital clock. All the hours and then all the minutes are shown on the two different clocks. This is basically a count-along-with-the-computer mode.

The next two options are practice modes. In the second mode, the child enters a time into the digital clock using the keyboard. The computer then displays the time on the tradi-

RAINBOW POSTER NOW AVAILABLE



Yes, it's here! A beautiful full-color poster of the cover of our January issue!

This big (31x23) poster is printed on heavy poster paper and varnished to make it really shine. It is the perfect addition to your computer room and is available for only \$5. There's even a small Rainbow logo in one corner.

Send for yours today! There is only a limited supply, and when we run out, there won't be any more.

Each poster is \$5, plus \$1.50 handling charge per order to same address in U.S. and Canada. Other points add \$3. U.S. Currency only. VISA, MasterCard and American Express accepted. Mail to: Rainbow Poster, P.O. Box 209, Prospect, KY 40059 or call (502) 228-4492.

tional clock. In the third mode, the child sets the hands of the traditional clock with a joystick. The joystick is positioned as if it were a clock hand, the fire button setting first the hour hand and then the minute hand. The computer then displays the same time on the digital clock.

The last two options are quiz modes with skill levels. The fourth mode prompts the child to select the digits that correspond to a randomly set time on the traditional clock face. In this mode, you do not have to enter leading zeros for single digit hours (example—04:30). Children can forget or become confused by those leading zeros, and this program wisely avoids them in the quiz mode.

In the fifth mode, the child sets the hands of the traditional clock with a joystick so that it matches the time randomly set on the digital clock.

The quiz modes have six skill levels which are incremented automatically after three correct answers are given in a row. The skill levels are: exact hours; half hours; 15-minute, 10-minute, 5-minute intervals; and all minutes. As students complete a skill level, they are rewarded with a flashing display and a star is placed on the screen.

In both quiz modes, if students answer correctly, they are rewarded with sound and a smiling face on the clock. A wrong answer in a low buzz while the correct answer is displayed. To continue the quiz after a wrong answer, simply press any key.

After or during a quiz, a detailed progress report can be printed on screen or on a printer. The report includes the child's name, the skill level reached, the number of times answered correctly, the total number of questions, a percent score and a weighted score.

Of course, nothing is perfect. The program doesn't provide an easy way to jump to higher skill levels for accomplished students. The random times used in the quiz modes sometimes cause easy times to appear at the higher skill levels or the same time to appear repeatedly. So, a child struggling at one skill level can get a couple of easy or repeated times. The child will then be incremented to the next skill level and be lost there with no way to get back. A possible solution would be to add an automatic decrementing of skill levels after a set number of wrong answers.

All in all, this is an excellent program for the home or classroom. Sound is used effectively throughout, neither overpowering the material, nor making wrong answers entertaining. Graphics are clear and the program is easy to use. Some adult guidance may be needed at first, but kids will quickly learn to use this program without help.

(Crystal Software, 6591 Dawsey Road, Rock Creek, OH 44084, \$15.95 on tape)

-James Ventling

Hint . . .

Get The Most Memory

You can get the most memory available on your CoCo by entering the command POKE 25,6:NEW. This, in effect, is a PCLEAR0 on your system.

This command will *not* work with a disk installed. It will, instead, clobber the disk operating system. If that happens, simply RESET CoCo.

Quality Software Is The Number One Priority At K & K COMPUTORS



LASER TANK - Pit yourself in a game of strategy and excitement against the computer. You must defend your flag from attacking tanks and destroy them before they destroy your flag or you!!! Only \$1595.

GAZON - The deadly Gazonians are trying to steal your supplies and you must stop them at all costs. Similar to the popular "RIPOFF" Arcade Game, this game has color and is faster. Machine language. Only \$1995.



MUTATRON - As the last person alive, you must protect yourself from sadistic robots bent on killing you. Another popular Arcade Game, "ROBOTRON", brought to you by **K & K**. Machine language. Only \$1995.

SHOOT TO SPELL AND FLASH MATH - An educational package that helps kids learn to spell and educate them on elementary math. An absolute must for adults with school aged children. Only \$1595.

SPACE HARVEST - Pilot your spacecraft above the Planetoid Voltar stealing spacefruit and trying to avoid alien guards. Machine language Only \$1,995

SERIAL TO PARELLEL CONVERTER - Have a printer with a parellel port? Tired of waiting for a line list? With this little hardware device you can make your color computer run at any baud rate between 300 and 9600. Let **K & K** help your printer to go much faster!!! Only \$6795.



BLACKJACK - A casino game that puts two players against the beady eyed dealer of the house. This dealer deals the cards as good or even better than Intellivision. If you have any gambling blood at all this game is a must! Same rules as any Las Vegas casino. Only \$1595.

TAPE INDEX - Trouble keeping track of what programs are on your tape? Now it's possible to place a directory on your cassette. Only \$1595



POLARIS - You are under the ocean in a submarine, attacking planes and enemy destroyers dropping depth charges attempting to destroy your sub. Can you destroy them before they destroy you? This is a fast action machine language program. Only \$1995.



SUPER ZAP - Enemy spaceships are attacking from all sides and your mission to defend your starbase from the deadly Armada of Pyruss. This will be a dangerous mission since the Pyruss Armada has never been defeated by any humanoid. Only \$1595

SKY DESTROY - Planes and helicopters are coming from all directions, they must be stopped! This game is similar to Atari's and now available to color computer users. Machine language. Only \$1995

BOWLING SCORED FOR DOLLARS - Do your leagues bowling averages. This program will keep individual scores, team totals, individual averages, team standings, and print all this information to your line printer. On cassette and disk, specify on order. Only \$1995.

INVENTORY CONTROL - This program contains all the necessary features required for all types of inventories: sort inventory by stock number, list stock number, description, amount in stock, cost, wholesale, profits. Only \$4995.

CHECK LEDGER - This bookkeeping system allows the user to have current information on your expenses by any category you wish. Year end tax statements made easy. Disk required. Only \$4995.

ACCOUNTS PAYABLE - Small businessmen, control your business growth by keeping track of all your cash liabilities and payment history. Only \$4995

ACCOUNTS RECEIVABLE - This system keeps track on the status of all customer accounts, all payment histories included. Only \$4995.

WE'VE CHANGED OUR NAME: FORMERLY K & K COMPUTORWARE, NOW K & K COMPUTORS.

ALL GAME PROGRAMS - require 16K extended(prices are set for cassette, add \$400 for disk, except business.)

PROGRAMMERS!!! - K & K pays the highest royalities for your programs. If your program is good, send it to K & K

TRS-80 COLOR COMPUTER USERS-New programs are added each week. SEND \$100 FOR OUR COMPLETE CATALOG



K & K COMPUTORS
P.O. BOX 833 ● STERLING HEIGHTS, MICHIGAN
48077

Telephone: (313) 264-7345





IF 'Program Control' THEN Fine ELSE GOSUB Confusion

By Richard A. White Rainbow Contributing Editor

Program control is nothing more than decision making and then taking appropriate actions after the decision. To make a decision, the program must make some sort of test. The result of any single test a computer makes is either a true or a false answer. Remember, it's a binary beast even when talking BASIC. If you had only IF THEN in your BASIC you still could write any program you wanted. Other control statements like FOR TO NEXT, ELSE, ON GOSUB and ON GOTO provide for simplicity, speed and efficient use of memory. We have used and commented on each of these statements at one time or another in previous articles. Now is a good time to compare them and suggest ways to use them that you may not have thought about.

IF A=B THEN 100. This is perhaps the simpliest of statements—it means just about what it says. IF A=B GOTO 100 is also acceptable BASIC and means the same thing. The 100 refers to line 100 in either case. If A does not equal B then the program goes to the next line in the program. If you need to go to a subroutine, then write IF A=B GOSUB 1000. IF A=B THEN GOSUB 1000 works also, but why keep the unneeded THEN around to take up memory space?

Any group of statements and functions may follow a THEN. For example, IF A=B THEN CLS: PRINT A\$ A: SOUND 100,10: GOTO 100. For the actions following the THEN to take place it must be true that A=B. When it is false that A=B, you will want some other action. With ELSE, this action can be placed in the same line of code. In most cases this leads to program clarity and simplicity. Our example is IF A=B THEN CLS: PRINT A\$ A: SOUND 100,10: GOTO 100 ELSE CLS: PRINT "NOT EQUAL": SOUND 50,10. Note that colons are not used on either side of THEN and ELSE. If you want to waste memory you can put then in, they will do nothing else for you. The ability that ELSE gives you to choose one piece of code or another is extremely powerful. Without ELSE you would be reduced to using IF THEN mainly to route the program to lines

(Richard White has a long background with microcomputers and specializes in BASIC programming. With Don Dollberg, he is the author of the TIMS data base management program.) where the needed code would be placed rather than executing the code directly. This of necessity would locate the code remote from the text calling it. Program clarity is significantly reduced, speed is reduced and memory usage is increased. Instances when you will want to branch to remote

"The ability that **ELSE** gives you to choose one piece of code or another is extremely powerful..."

lines are when you are going to major program routines or are going to subroutines used by other portions of your program.

IF THEN's can be nested; that is, one following another in the same line with or without intervening code. Following are some lines I used a couple of columns ago, but reformatted to help show the relationships of the keywords to one another.

IF (Test 1) THEN (if Test 1 is true)

IF (Test 2) THEN (if Test 2 is true ACTION A) ELSE (if Test 2 is false ACTION B)

ELSE (if Test 1 is false ACTION C).

The second *IF* is inset under the first *THEN* that it follows. Each *ELSE* is placed under the *IF* that refers to it. An *ELSE* will be related to the closest IF that does not have an *ELSE*. If the *ELSE* under the second *IF* were removed, then the remaining *ELSE* would automatically be associated with that *IF* even though it is followed by code relating to the first *IF*. If you had no ACTION B in the event that Test 2 is false, put the *ELSE* in anyway so that ACTION C will occur when Test 1 is false.

IF (Test 1) THEN (if Test 1 is true)

IF (Test 2) THEN (if Test 2 is true ACTION A) ELSE

ELSE (If Test 1 is false ACTION C).

You can test for many things after an IF. These include A less than B- A \leq B, A less than or equal B- A \leq B, A greater than B- A > B, or A greater than or equal B- A >=B. Of course both sides need not be

variables. A > 0 or B = 5 are quite acceptable. You can do the same tests on strings like A\$ = "GOLIATH" or A\$ > "DAVID." Let's assume that A\$ = "GOLIATH." Others might point out that David defeated Goliath and in that sense A\$ > "DAVID" is false. Old CoCo could care less about all of this and looks only at the ASCII values for "G" and "D." In ASCII terms, "D" is 68, "G" is 71, and 71 is bigger than 68. The matter is settled right there and "GOLIATH" is greater than "DAVID." If CoCo had to choose between "GOLIATH" and "GARP," it would go on the second letter to find a separation.

Up to now things have been straightforward in that one test was made and one or another action taken depending on whether that test proved true or false. Real life, even in a computer, is that a number of conditions need to be met for some action to take place. IF I can find \$600 AND convince my wife that it is necessary, THEN I will buy a disk drive. Well, those who wrote our BASIC saw to it that we would have ways to make decisions based on a number of tests. We have already discussed one way. IF (Test 1) THEN IF (Test 2) THEN (Action). Alternately, this can be written IF (Test 1) AND (Test 2) THEN (Action). In BASIC this might be IF A = B AND A\$>"DAVID" THEN PRINT "SUBSCRIBE TO RAINBOW." To muddy the waters even more this will work—IF A = B AND A# > "DAVID" OR C > 22 THEN PRINT "SUBSCRIBE TO RAINBOW." See the OR?. If C were the contents of your bank account and it were greater than \$22 then the message "SUBSCRIBE TO RAINBOW" would be printed irrespective of whether A = B or GOLI-ATH is greater than DAVID. Tests can be strung together

with AND and OR in almost any conceivable way which makes them powerful tools in the programmer's bag of tricks.

One useful application is enabling either upper or lower case input to control program action. In the June 1983 Rainbow, Mr. Ed, a simple but powerful word processing program appeared. Its author, Hubert Samm, wrote it for generating and editing assembly language text files. As such, he had little need ever to use it in lower case and provided no way to input lower case commands. I came to discover that the Dugger C compiler that I had recently purchased required characters in the text file that were not supported by Telewriter. These are the back slash up arrow and the square brackets in particular. However, much of "C" is written in lower case which made Mr. Ed difficult to use. So with some simple reprogramming, lower case came to Mr. Ed by ORing a lower case letter in each IF statement. The edited lines of code are below for those who may want to enhance Mr. Ed

60 TIMER=0:C\$="A":C=1

70 IFC\$="N"ORC\$="n"GOSUB370

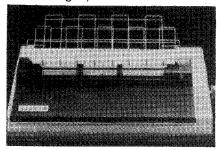
80 IFC\$="I"ORC\$="i"GOSUB410

90 IFC\$="T"ORC\$="t"GOSUB450

100 IFC\$="D"ORC\$="d"GOSUB460

Heavy duty PRINTERS READY for the Color Computer!

All set to fly! We set all connectors & switches to JUST PLUG IN AND WORK! ALL cables AND serial interfaces INCLUDED. Phone us toll-free 800-323-9790 to confirm discount price (we placed ad months ago!) in case it's fallen.



Star Micronics Gemini-10/-15 quality

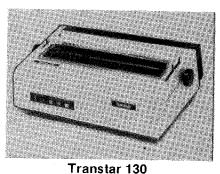
Friction, tractor, bit-map Epson-compatible graphics, 100 cps. 10" wide \$449. 15" wide \$599. Extra ribbons: \$15 per six.



Mannesmann Tally MT 160 quality

Word processing at 40 cps or 160 cps good printing! Friction, tractor, bit-map graphics, up to 160 columns. Auto justification. \$689.

FREE SHIPPING (regular UPS) with money order or certified or cashier's check over \$100, otherwise add 2% shipping (min \$2). VISA/MC accepted. Phone 800-323-9790 Illinois 312-295-6888.



quality

Impeccable daisywheel print at 16 cps. 2K buffer, 17-inch carriage, bidirectional, 10 & 12 pitch. Just \$789. SPOOLER BUFFERS AVAILABLE!



P.O. BOX 774, LAKE FOREST, ILLINOIS 60045

110 IFC\$="F"ORC\$="f"GOSUB470

120 IFC\$="E"ORC\$="e"GOSUB540

13Ø IFC\$="X"ORC\$="x"GOSUB62Ø

140 IFC\$="R"ORC\$="r"GOSUB640

150 IFC\$="L"ORC\$="1"GOSUB650

160 IFC\$="P"ORC\$="p"GOSUB720

170 IFCs="Q"ORCs="q"THENEND

180 IFC\$="G"ORC\$="g"GOSUB780

190 IFC\$="C"ORC\$="c"GOSUB870

200 IFC\$="U"ORC\$="u"GOSUB1140

210 IFC\$="2"GOSUB1160

211 IFC\$="K"ORC\$="k"GOSUB1200

212 IFC\$=CHR\$(94)GOSUB1300

215 IFC\$="M"ORC\$="m"THENK\$=TX\$(CL)
#GOSUR620

217 IF C < 10 THEN C=C+1 : GOTO 70

220 T=TIMER/60:PRINTT" SECONDS"

Lines 60, 217 and 220 are my addition to time the speed of execution and are not to be changed or added to the Mr. Ed program. Also note in line 212 that I had to use CHR(94) rather than an up arrow, another character not supported by Telewriter. In this case it's no problem since BASIC fully understands CHR\$(94). If you were to put the above code in the computer and run it, it would print 1.3 seconds (approximately). That is the amount of time to loop through the tests only 10 times. This is a worst-case-plus condition; it will take less than one tenth of a second to test and take action. Still, response time is the name of the game and I will propose a fix later. I initially used a FOR TO NEXT loop to control the looping but changed to using an IF THEN construction for this article. C is the loop counter. It is initialized, C=1 in line 60. In line 217, it is tested and incremented if less than ten and the program is sent back to line 70 for another pass. The function is exactly the same as FORTO NEXT, but a bit slower and not as memory efficient. Indeed, the logic is the same as FOR TO NEXT with the counter initialized at the beginning, and tested at the end. In both cases if the counter stays less than the ending count (or greater than FOR we can loop down-count as well as upcount), the program loops back.

As noted, FOR TO NEXT can be replaced with a simple IF THEN statement. So why use FOR TO NEXT? It's easier. All you and the program need to know about the loop are right up there in the line heading up the loop. FOR TO NEXT is faster since BASIC knows up front what you want and can use the most efficient machine language coding to

Talk is Cheap!

You want your color computer to talk, but how much will it cost? \$50...\$100...\$200...NO!

HOW ABOUT \$2995?

SPEAK UP!™ is a machine language Voice Synthesizer program for your TRS-80 Color Computer.* It is 100% software. Nothing else to buy. Best of all, YOU can make basic programs talk!

16K and 32K versions on one cassette. Has text to speech capability.

*T.M. Tandy Corp.

16k minimum

It's easy to use, and will say virtually anything!

Talk really is cheap!

Reviewed in the April issue of Rainbow.

COD orders, checks accepted - NO DELAY WE PAY POSTAGE

1-800-334-0854, ext. 890 Except North Carolina







Classical Computing, Inc. P.O. Box 3318

Chapel Hill, NC 27515

get it done. In the *IF THEN* approach above, the BASIC interpreter never knows it is doing loops. Here is the basic syntax of *FOR TO STEP NEXT*.

FOR (variable & initial value) TO (limit value) STEP (value) . . . NEXT

The initial value, limit value and step value may be positive, negative, integer or decimal. Looping continues as long

"In some listings, you will see the variable name after NEXT like NEXT C... The computer knows full well which variable it is dealing with and doesn't need the programmer telling it."

as the variable remains less than (or more than) the limit value. Any of the following are valid.

FOR $C = 1 \text{ TO } 10 \dots \text{ NEXT}$

FOR $C = 132.769 \text{ TO } 133.543 \text{ STEP } .008 \dots \text{ NEXT}$

FOR $C = 1000 \text{ TO } -732 \text{ STEP } -200 \dots \text{ NEXT}$

FOR C = -1 TO -10 STEP -1 . . . NEXT

FOR $C = 1E1 \text{ TO } 1E35 \text{ STEP } 9E10 \dots \text{ NEXT}$

FOR $C = 0 \text{ TO } 0 \dots \text{ NEXT}$

Without STEP, BASIC assumed an increment of +1, which is a very typical case. Otherwise there is nothing special about STEPing. Just make sure you STEP in the

right direction to get from the initial value to the limit one. No matter what the values assigned, a FOR TO NEXT loop is always executed at least once. It is necessary for the program to get to NEXT before any test is made. In some listings, you will see the variable name after NEXT like NEXT C. No, you don't see it above. The computer knows full well which variable it is dealing with and doesn't need the programmer telling it. From a programming clarity viewpoint, some case can be made for documenting the NEXT with its associated variable.

BASIC stores the location of the start of the FOR TO NEXT loop on the microprocessor's stack in memory. When the program exits normally, these memory locations are cleared for other uses. When a FOR TO NEXT loop is abnormally exited, these memory locations are not cleared. There are occasions when early departure from a loop is needed. There are a number of ways to do this. When this done, there should be code to set the count variable to a number equal or higher than the limit value and follow this with a NEXT in order to clear the stack. Here is an example.

100 FOR C = 0 TO X : IF Y > Z THEN C = X : NEXTGOTO 200

110 'CODE IN THE LOOP

120 NEXT

130 'CODE FOLLOWING THE LOOP

There are times when it is not desirable to go through the loop even once. In our BASIC you must test the governing condition and jump around the FOR TO NEXT code or abandon FOR TO NEXT writing your own loop control

NEW KODOMO~NO~GO

Get 5 in a row before your opponent. 19 x 19 playing matrix. This is the favorite relaxation game for Japanese Go players. Two-player version and 4 computer skill levels for one player: also Tic-Tac-Toe on the same tape.

\$19.95 32K Ext. Basic cassette only.

\$14.95 16K Ext. Basic. Three skill levels plus Tic-Tac-Toe.

\$ 8.95 16K Ext. Basic Tic-Tac-Toe only.

ALSO CO-EXISTENCE

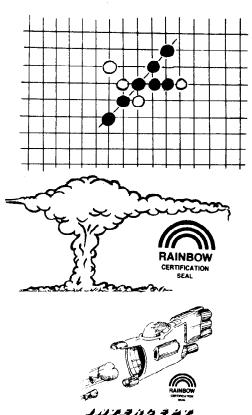
Successfully develop your country in a resource-limited world. Form a world government, sign treaties, go to war: anything goes. This is a two - to six - player game which combines computer and board play (board and pieces provided).

\$24.95 16K Ext. Basic cassette only.

AND'S EXCITING GAMES

Be a Cosmic Trash Collector, fight a mighty space battle, or surround your opponent in Trap'em — all this and more on one tape. The RAINBOW says, "Great fare for the family with young children."

\$15.95 16K Ext. Basic cassette.



ن و در برمز بروس

Cherry Hill, NJ 08034

P. O. Box 4016

with IF THEN. Here is one approach.

100 A = 1

105 IF A > X GOTO 150

110 'LOOP CODE

140 A=A+1:GOTO 105

One reason for the need to do this would be if you were taking a series of strings apart, perhaps for printing fields of records. If the user had put no data in yet and X = 0, but made the mistake of trying to print, a SN ERROR would greet their efforts as soon as the program tried to take an empty string apart. Now, no programmer wants a user to be greeted with a SN ERROR—ever. So constructions like the above are necessary now and then. Some languages and dialects provide alternate statements like DO UNTIL that test first and then act. What is most important is to know what the characteristics of your language are and use them to best advantage. The grass may look greener over the PASCAL fence. That does not mean it's better grass. And while we are at it, you should be aware that the same keywords may act differently in another language. IF THEN ELSE seems to be one of the few constants.

The two other program control statements in Color BASIC are ON Z GOSUB and ON Z GOTO. Z is a number starting with 1 which tells the computer to count to a specific line number listed after the GOSUB or GOTO and go to that line. Earlier I promised an improvement for Mr. Ed. Here it is

LINE PRINTERS



CENTRONICS 588 (used) serial 600 Baud, 88 CPS with 4 pin DIN plug

All prices F.O.B. Henderson, Tx. Terms: Cash, check or COD Tx. residents add 4% sales tax

LEADER SALES CORPORATION
P.O. Box 1220, Henderson, Tx.75652
214/657-7800 after 6:00 P.M.

Discounts available to CC clubs and volume buyers.

- 50 TIMER=0:C\$="A"
- 60 FOR X=1TO10
- 80 B=INSTR(1,"NnIiTtDdFfEeXxRrLlPpGgCcUu2Kk †A".C\$)
- 90 ONB GOSUB 370, 370, 410, 410, 450, 450, 460, 460, 470, 470, 540, 540, 620, 620, 640, 640, 650, 650, 720, 720, 780, 780, 870, 870, 1140, 1140, 1160, 1200, 1200, 1300, 225
- 215 IF C\$="M"ORC\$="m"THENK\$=TX\$(CL): GOSUB620
- 220 NEXT:T=TIMER/60:PRINTT
- 225 RETURN

As before, there are some changes that were made to this code piece for timing purposes that should *not* be made in Mr. Ed. These include lines 50, 60, 220 and 225 above which should not be changed if you modify the program. This code does the same thing as the IF THEN line we discussed before, but does it in one third the time. Further, it uses only 360 bytes versus 716 bytes for the series of IF THEN statements. The INSTR statement in line 80 hunts through the string of characters trying to find a match for the character in C\$. If it finds a match, the test is successful and it puts the count up the string in B. In ON B GOSUB the computer counts up line numbers to the number in B and makes a subroutine call to that line number. For the timing text, I set C\$="A" and put A at the end of the string in INSTR. INSTR sets B=31 and the 31st number in 90 is 225. The program goes to 225, returns and then goes on line 220 where it finds the NEXT for another cycle. Obviously the INSTR-ON B . . . technique is quite effective here. If you only had three or four characters or values to test, IF THEN would be preferred.

Now, I am aware that *INSTR* is not in Color BASIC, and those without Extended BASIC are out in the cold again. Not necessarily so. *INSTR* is a command for which a BASIC subroutine may be written as a substitute. Take heart, Color BASIC owners, and use the following.

- 10 'SUBSTITUTE FOR INSTR. DEFINE A START LOCATION SL, A TARGET STRING TS\$ AND A STRING OF CHARACTERS, C\$, TO SEARCH FOR IN YOUR PROGRAM AND DO 'GOSUB 10'.

 12 LT = LEN (TS\$): LC = LEN (C\$)
- 14 IFLC+SL>:LT THEN SL=0 : RETURN ELSE F\$= MID\$(TS\$, SL, LC) : IF F\$ = C\$ THEN RETURN ELSE 14
- 16 'IF C\$ IS FOUND IN TS\$, SL WILL CONTAIN THE POSITION IN TS\$ WHERE C\$ STARTS. IF C\$ IS NOW FOUND, SL WILL CONTAIN 0.

To summarize, program control is accomplished with statements that perform one or more tests and take actions based on whether true or false results are obtained for each test. What action takes place depends on how the programmer writes the statements. The control tools in Color BASIC are IF THEN ELSE, FOR TO STEP NEXT, ON GOTO and ON GOSUB. IF THEN ELSE is extremely powerful and could be used only without seriously limiting one's ability to write complex programs. The other statements provide for program clarity, speed and economy of memory. Each has its place, so serious programmers learn to use each to best advantage through in-depth understanding of each.



^,	FOR THE COLOR COMPUTER				
	All programs a	are in 16K ma	chine language unless noted.		
	MARK DATA PRODUCTS		DATA SOFT		
* 1	SPACE RAIDERS New Invader-type game.	\$21.95	Top Notch Games		
•	Super Hi-Res Graphics and Sound. You'll love it. **ASTRO BLAST Excellent space shooting game. Super Hi-Res Graphics and Sound.	\$21.95	* ZAXXON (32K) Maneuver your ship through a battlefield of state-of-the-art missiles, anti-aircraft	\$34.95	
1	COLOR HAYWIRE Classic arcade game,	\$19.95	tanks and enemy planes. Survive all that and you'll meet the deadly ZAXXON Robot!		
	rated A+ by Color Computer magazines. SPECTRAL ASSOCIATES		** MOON SHUTTLE Pilot your moon shuttle through outerspace avoiding man-o-wars, meteors,	\$31.95	
,	ANDROID ATTACK Excellent Berserk-type game. Comes with 16K and 32K. 32K version	\$21.95	bomb launchers and expandos to meet the prince of darkness. But watch out for his darkest side.		
,	will talk.	A04 0F	COMPUTERWARE		
	MS. GOBBLER (32K) Outstanding Pac Mantype game with 4 different mazes and 16 skill	\$21.95	* DOODLE BUG Just like Ladybug in the arcade.	\$21.95	
	levels. WHIRLYBIRD RUN Pilot a chopper over a	621 OF	THE CORNSOFT GROUP		
	varying terrain while dropping bombs and firing	\$21.95	** FROGGER Just like the arcade.	\$19.95	
	missiles to destroy enemy bases, ships and		ELITE SOFTWARE		
*	missiles.	440.05	* ZAKSUND (32K) Fly your spaceship through	\$24.95	
	GALAX ATTAX Protect your base by shooting alien fighter in formation. Excellent Graphics and Sound.	\$19.95	enemy star bases. Avoid guided missiles, lasers and firing turrets. Can you reach their leader?		
* *	SPACE RACE Maneuver yourself in space	\$19.95	SOFT SECTOR MARKETING		
	but alien ships appear and must be destroyed. Hi-Res Graphics and Sound.		MASTER CONTROL II Comes with plastic keyboard overlay and complete easy to understand manual.	\$19.95	
	PLANET INVASION Excellent Defender-type game. Highest-Res Graphics and Sound.	\$19.95	COLOR GRAPHIC EDITOR This program	\$19.95	
*	DEFENSE Defend your spaceships from enemy laser beams.	\$19.95	permits the creation of graphic pictures on the screen that can be saved to disk for later use.	710.00	
*	SPACE WAR You must break through the	\$19.95	Requires extended BASIC or DISK BASIC. * COLOR CATERPILLAR Excellent Graphics	\$19.95	
	enemy fighters and the defenses of Death Star. Super fast.		and Sound.	¥ 13.30	
* *	SPACE INVADERS Fast action Invader game. Excellent Graphics and Sound.	\$17.95	COLOR BONANZA 50 programs on 6 cassettes stored in an attractive package. Some	\$39.95	
*	GHOST GOBBLER Highly rated Pac Mantype game. 16 skill levels and lots of action.	\$19.95	require extended BASIC. SUGAR SOFTWARE		
	KEYS OF THE WIZARD Super adventure	\$19.95	Extended BASIC Programs		
	game! Great sound! You never play the same twice.		TIMS Excellent personal database management system.	\$24.95	
*	TOM MIX SOFTWARE	+04.05	GALACTIC-HANGMAN Top-rated Hangman	\$14.95	
*	DONKEY KING (32K) Just Outstanding! KATERPILLAR Excellent Centipede-type	\$21.95	game. Can you find a better one?		
	game. Highly rated by Color Computer	\$21.95	INTRODUCING!		
*	magazines! TRAP FALL Just like Pitfall.	\$24.95	** GRAND PRIX (32K) Race against the clock	\$24.95	
*	WAR KINGS Battle to save your castle and	\$15.95	and challenge the Mario Andretti in your soul. From Computerware.		
	king. Hi-Res Graphics with Outstanding Sound.	¥ 10.55	** LANCER (32K) Excellent Joust-type arcade	\$21.95	
*	PROTECTORS (32K) Excellent Graphics and Sound.	\$24.95	game. From Spectral Associates.		
	MED SYSTEMS		UPGRADE YOUR COLOR COMPUTER!		
	INVADER'S REVENGE You are the last sur-	\$19.95	Complete solderless kits with easy-to-follow inst		
	vived space invader. You must revenge! PHANTOM SLAYER Enter the deadly cata-	\$19.95	4K-16K For All Boards \$15. 4K-32K For All Boards \$49.		
	combs and destroy the phantoms, 3-D Graphics.	\$ 13.35	4K-32K For All Boards \$49. 16K-32K For All Boards \$34.		
	INTELLECTRONICS		64K For E & F Boards Only \$54.		
*	DUNKEY MUNKEY (32K) Absolutely excel-	\$21.95	*IF POSSIBLE, PLEASE SPECIFY BOARD REVISION WITH		
	lent Donkey Kong-type game. You'll love it!		64K CHIP SET	`	
	STAR FIRE One of the best Defender-type game. Hi-Res Graphics and Sound.	\$19.95	Eight 4164-200 NS Prime ICs Note: All ICs used in our kits are first quality	\$51.95	
	INTRACOLOR		200NS Prime Chips and carry one full year warran	ity.	
* *	COLORPEDE Just like the arcade.	\$25.95	*Requires Joystick **Joystick Option		
*	ROBOTTACK Just like the arcade.	\$24.95	ORDER 2 ITEMS AND GET 10% OF		
	THE PROGRAMMER'S GUILD		We pay postage on all orders in the United and Canada. Overseas please add \$3.	on States	
⊼ *	PACDROIDS The most challenging Pac Mantype, Super Hi-Res Graphics and Sound.	\$19.95	We accept check or money order. U.S. funds only for foreign orders.	.50	
	CHROMATIC SOFTWARE		Send to:		
*	THE COINED To a second of the country of the countr	44000	SELECTED SOCTIVADE		

\$19.95

THE SPIDER Travel the channels destroying

the spiders before they get you. Super action. Excellent Graphics and Sound.

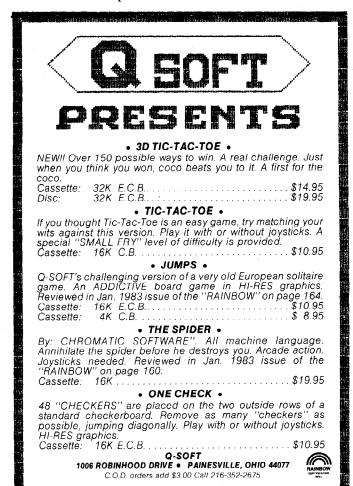
SELECTED SOFTWARE P.O. Box 32228, Fridley, MN 55421 (MN Residents add 6% sales tax.)

Vocabulary Builder Gets Constructive Criticism

By Dr. Charles H. Santee

Vocabulary Builder from Computer Island deals with an important area of learning and is based on some good ideas; however, the program has much room for improvement. The program begins with a modest title page and there is a short pause while data is being read. You are then asked to give your name and to tell if you have a printer on. If you respond with "yes" or "Y" the printer prints "vocabulary words for" and the name entered.

A page appears which is divided into several sections. The top part of the page identifies the number of words presented and the level. This is followed by a short question to answer. Four answers are presented one at a time for a brief period while a tone plays and then all four answers are reprinted for viewing. The person using the program selects the letter in front of one of the answers. If the answer is not correct, the program plays a low tone and the correct answer is shown. A correct answer is greeted with a higher tone and the message "Correct" followed by the person's name. You are then given a message to press ENTER which takes you on to the next question. After 10 responses, the program prints the words needed for study on the screen and with the printer (if that option was selected). After five sets of 10 words the program tells you that you have completed that set and shows the percent correct.



The documentation states that the program is modifiable by the user and gives some short directions. You can purchase programs for three different levels (grades 3—5, 6—8 and 9—12). The program does use a consistent method for entering information and answers. You would always respond by typing an answer and pressing ENTER. Each program in the series contains 200 questions and 1,000 words.

I am a teacher, but I don't claim to be an expert in teaching vocabulary. However, I feel the selection of questions and responses was generally good. In all cases, there appeared to be a clear best answer. There were a few times that I feel the correct answer was an unusual nuance of a word. On those occasions, deriving the meaning of the word from the correct answer may be somewhat misleading. However, this was an exception rather than the rule.

The documentation does not mention what source was used to select the words used and how the level was determined. I think this is important information that should be included.

Now for the bad news. In *Vocabulary Builder*, questions are selected at random. This is generally a good practice in educational software. However, the specific application in this instance has an unfortunate result. Each question is selected at random from the entire list of 200 words. The question is then eliminated from the pool of questions so that you can be certain the same question is not given again. At the end of 50 questions, the program is *RUN* so that the entire pool of 200 words is again available. You might think that doesn't sound so bad. However, using this method you may *never* see all the words in the list. In fact, there is a good probability you could use the program a large number of times and miss some of the words.

My next area of concern was the amount of memory used by this program. The program requires 32K of memory. In fact, with a disk drive installed, you need to *PCLEAR 1* before *RUNning* the program. My own particular feeling is that this program is not worthy of that much memory use. Most of the memory is used by the list of words and questions.

The easiest solution to both problems listed above would be to make four separate programs with 50 words each. Then all questions could be tested and the program would fit into a 16K machine. In fact, I would venture to say this program could be modified to work in 4K. I would recommend putting a series of smaller programs on one cassette. The user could master the words in one program and then progress to the next. I have another better suggestion which I will outline at the end of this review, so don't stop reading here.

The Vocabulary Builder documentation outlines a brief description of how to enter data lines to modify the program. You need to enter a question, four answers, the letter of the correct answer, and the correct answer. The documentation states that you must keep the same number of items as the original program. If the documentation had shown how to modify the lines where variables were initialized, you could have easily set this program to accept data lines of any quantity desired. Second, the correct answer is given twice (once in the list of questions and again as the last data item). Since the letter of the correct answer is included, the program could have used this letter as a pointer to the answer and the last data item could have been dropped. This would mean that the program would need less memory and modifying the program would require less typing.

I believe that some of the other problems of this program

UPILITI TREVILIKI KALIBI KATAN K

were due to an attempt to keep the program short so that a large number of items could be included. Since we have solved that problem, let's see how we might improve the rest of the program. The program uses a standard INPUT statement to accept data. This means that the CLEAR key will operate and a child could accidentally erase the entire screen. It would be possible to eliminate the problem by using an INKEY routine. The INKEY routine could also provide better protection for wrong responses. At the end of 50 questions, the program accepted an ENTER to a yes/no question. I would like the program to only respond to the correct response of YES or NO(Y/N) or to give a message of help when wrong keys are pressed.

When the program asks if the printer is on, a child could accidentally answer YES and the program would hang up looking for the printer. I would like a routine that would check the printer status. We don't need to give kids any hang-ups.

At the end of 10 items, the list of items missed will show about seven items on the screen. If the child misses more than seven, the first few items scroll out of view. I would like to see a routine that would control how much is put on the screen at that point (ie, show seven missed items and then press a key to see the rest).

Although not stated in the documentation, the largest question should be no larger than 28 characters. Second, each answer should be no larger than 14 characters. Data items larger than this do not fit into the format of the screen. With very little modification, this program could be used not only for vocabulary but for any multiple choice type question. However, even for vocabulary I would like to have twice as much space to write a question. The space for answers is adequate for most words, but I might like to add a phrase or two as an option for an answer.

I found the tone and response to each answer monotonous and after a while annoying. I would like to see more variety. Let's add a little flash after 10 correct answers. The rate at which questions were presented was just a little too

slow. The author chose to use a FOR-NEXT statement with a POKE of each memory location to make the background colors in certain screen areas. I believe printing a graphic string would have been quicker.

In my opinion, this program did not make adequate use of the capabilities of a computer. The same thing could have been accomplished by using index cards with questions on one side and answers on the other side.

Let me give an example of what I would like to see in a program to develop vocabulary. This would work best with a disk, but would be feasible for cassette. The program would have all the questions and vocabulary words saved in several data files that were separate from the program. The program would call up the first file and test the student. The items the child missed would be saved back to disk. The items the child didn't try would be saved as another file. The next time the program was used, the program would call back a few items the child missed the last time and add some new words. The program would progress in this fashion until all words were mastered. While we are at it, let's measure how fast the child responds, how many items a child responds to in one sitting, and the classification of words the child misses (ie, easy-hard or nouns vs. verbs). Let's give the screen some animation and variety as the program (and the child) progresses. Finally, why not include one printout for the child for feedback and review and a second that is activated by a teacher's code word or program for diagnosis of learning needs.

In conclusion, I felt that *Vocabulary Builder* dealt with important subject matter, had a few interesting features (such as printing words missed) but was generally quite disappointing.

(Computer Island, 227 Hampton Green, Staten Island, NY 10312, 32K, three levels at \$19.95 each)

All Color Software

Post Office Box 15235 Plantation, Florida 33318

New from ACS . .

RS232 SWITCHER --- \$30.00

Tired of changing peripherals, plugging and unplugging cords? Don't have enough cable to reach the printer or modem? Tired of paying more for the other guy's products??? Then ACS is ready to help you!! Our new 2-plug RS232 switch box is a must at only \$30.00!!!; and our extension cables are as reliable as ever at only \$10.00!!

Sound great?? Well, here's the best part! Our products are LESS!!! Don't wait, order now!!!

RS232 Switch Box.....\$30.00 Extension cable (10 feet)....\$10.00

Add \$3.00 shipping To all orders.

(Printer, Modem, or Cassette)

Florida residents add 5% sales tax.

Match & Spell Sparks Enthusiasm For Learning

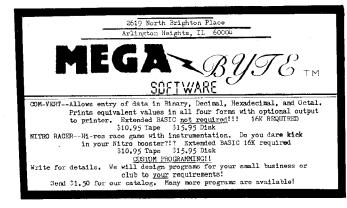
Does your child need some improvement in spelling skills? Perhaps he or she has lost interest in that old spelling list program you wrote. If so, spark up some new enthusiasm for learning and let the kids play *Match & Spell* on their favorite computer. Kids will *ask* to practice their spelling words once they have played this educational game!

Did I say game? The kids in our house and neighborhood think it's a game. My kids, age four, six, and nine, are really excited about *Match & Spell*. This program very nicely incorporated the TV matching game of Concentration with a spelling drill of up to 20 words. Each word in the list can be up to 11 characters in length. The object of the game is to collect squares by matching up the hidden graphics. The educational objective is to improve spelling skills, and my kids have had fun doing both.

After CLOADing Match & Spell, you can watch the title page write the words "match and spell." From then on, the program very effectively prompts you to do everything you need to do. By the way, the documentation is very clear and well written, from the general setup of the program to the thorough description of the game play and what to expect as the game proceeds.

You start off by loading the word list, either from the keyboard or from a tape file you may have created before. The program comes with a sample spelling list to get you started. However, the ('LIST') is at the very end of the tape after three program saves. So if you don't know where it is you have to wait and wait. Creating your own word list is very easy through the program prompts and includes a chance to change a wrong spelling or change words entirely before saving to tape or using them in the program.

Once the word list is entered, the words are displayed in two columns for you to study as long as you want. When you are ready the game begins. The game prompts you for two players' names, although one person could play both positions. A new screen appears with 12 numbered blue squares. Each player, in turn, chooses two squares in an effort to match two with the same hidden graphics. If those two squares match, the program randomly selects one of the words from the list and presents it to you either correctly or misspelled with a common spelling error. For example, ('computer') might be presented as ('computor.') If this question is answered correctly, the word is removed from the screen and the player is required to type it in correctly, being



given three chances to do so. If he is unable to spell the word correctly, he forfeits these two squares and his turn. If a wrong answer is given to the previous question, the player also loses his turn and the squares he had just matched are turned around and become available for the other player if he can correctly match and spell the next word chosen.

If a right spelling is given, then the matched squares are colored in with that player's color and the player is given another turn. Play continues until all 12 squares have been matched. Chances are you would have to play the game at least twice to cover a full spelling list. At the end of the game, the program lists any words that a player had difficulty with and gives you the option of continuing another game with the same word list or using a new list.

I think *Match & Spell* is an excellent program and provides a well balanced and effective intermingling of play time with spelling drills, in contrast to some spelling/math drills which require you to reach a certain performance before being rewarded with play.

It was also noted in the documentation that the random misspelling of the words works best on words of five or more letters. I found this to be true. The program runs well and is very easy to use. (My wife wanted me to be sure and say that, as she has commented that Match & Spell is one of the easiest programs she has had to help the younger kids with when I'm not home.) Younger children, around age six and under, may need some help and guidance to read the prompts, etc. at first, but they catch on fast! The word list can be changed readily to accommodate appropriate vocabulary. For my youngest daughter, age four, we used words like family members' names, her name, dog, cat, etc.

It may take longer to go through a spelling list using *Match & Spell*, but the kids think it's neat and really enjoy it. Plus, there is no "Awww. Do I have to practice my spelling now?"

Documentation is complete and well written. Really, the only criticisms I had was having to wait so long for the sample list to load and waiting during the delay time between screens after you've made a match and while the computer is selecting a word and misspelling it. It bothered me slightly, but the kids apparently didn't mind as they have never mentioned it.

If you are the programming type you might consider adapting this program to math drills.

This educational game is for all ages (including mom and dad). *Match & Spell* requires 16K Extended Color BASIC.

(Harmonycs, P.O. Box 1573, Salt Lake City, UT 84110, \$11.95 tape)

-Kenneth D. Peters

How To Clear All Graphics Pages

You can clear all your graphics pages—and thus increase free memory—by entering the following command: *POKE25,6:NEW*. If you do this, you will not be able to use graphics pages, but you will have more program memory.

Caution: Do not try this POKE with any program in memory. It will destroy whatever program is resident in the 80C.



The Write USING THE COLOR COMPUTER TO DEVELOP COMPOSITION TOPICS

By Stephen N. Tchudi

s a teacher of school and college writing courses, I have been somewhat disappointed by the computer software programs that have been written for my field. Whether produced by major educational publishers, the computer manufacturers, or basement hobbyists, programs designed to develop language seem to me inordinately concerned with drill in so-called "basic skills"—particularly grammar, vocabulary and spelling. Now a computer can do that sort of drill very effectively, probably more effectively than an English teacher and with a good deal more pizzazz. But using a computer principally for drill seems to me to ignore its much broader potential for aiding youngsters in developing their language skills. Further, the bulk of educational research suggests that drill, even when done well, is not the best way to get students to use language more effectively. Language is a "learn by doing" skill; the more people use it, the better they become at using it.

Since buying my CoCo a little over a year ago, I have been studying language programs and exploring ways to use the computer "creatively" to help students learn to write. The program presented here—I call it "The Write Idea," but "The Wryte Idea" might be better—is intended to help students from the middle grades through adulthood solve one of the biggest barriers to successful writing: finding something to say.

(Stephen Tchudi is a professor of English at Michigan State University, where he directs the English Education Program. He is a member of the Lansing, Michigan Color Computer Users Group.) Most novice writers undervalue their own experience and fail to realize that they have hundreds and hundreds of potential writing topics in their memories. "The Write Idea" helps a student get some of these ideas out of his or her mind and down on paper.

The program is written for a 16K CoCo and uses a Line VII printer. As the student answers questions flashed on the monitor, the printer springs to life, writing down the answers in the Line VII's CHR\$ 31 boldface for dramatic effect. (The answers simultaneously appear on variously colored monitor screens.) The printer also adds headings, formats the answers, and throws in some asterisks to highlight the student's ideas.

The program is written in two parts: Part I helps the writer list a number of potential topics and select one to write about; Part II has the student develop specific ideas as a way of "pre-writing" and planning the paper. In a twenty to thirty minute run-through of the program, a student will characteristically produce a three- to five-foot printout, ending forever the complaint that English teachers hear so often, "I haven't got anything to write about."

Part I

Lines 5—130 clear string space and present the program title

Lines 140—290 explain the aim of the program, ask the student's name and instruct him/her to turn on the printer.

Lines 300—1190 quiz the writer about past experiences, asking him/her to "peek and poke" in memory to recall "Firsts" (first love, first pet, first day at school [lines 300—



A Hi-Res version of the card game. Your partner is the computer, the opponent team is played by the computer. Allows any of the four players to "GO" alone.

(ECB, 32k)

Cassette



Examine and fix sector data, also includes disk read, write, file information display, and selective disk backup.

ML. 16k or 32k)

Disk (With Source) \$24.95

MORE CSG PROGRAMS!

·UTILITIES ·

CCADS - A full 6809 machine language monitor with line assembler and disassembler. All you need to debug machine language programs.

(ML, 16k or 32k)

Cassette \$19.95 or Disk (With Source) \$23.95

UNLOCK - A complete disk backup utility. Features included are initialization of any track; copy any track and correct I/O errors, or leave them intact; and verify any track. Track numbers up to track 80 may be used at any time

(ML, 16k or 32k)

Disk (With Source)

CHROMA-KEYS — Define function keys and save them to disk or cassette.

(ML, 16k or 32k)

Cassette \$9.95 or Disk (With Source) ______ \$13.95

SPOOLER — Print ASCII files from disk without waiting.

(ML, 16k, 32k, or 64k only)

Cassette \$11.95 or Disk (With Source) \$15.95

COMMAND — Add machine language programs as commands to

(ML, 16k or 32k)

Cassette \$15.95 or Disk (With Source) \$19.95

· GAMES ·

PROSPECTOR — An ECB Hi-Res graphics game. Can you get the gold

out of the mine?

(ECB, 16k or 32k)

JUMP-A-PEG — A Hi-Res version of an ancient strategy game.

(ECB, 16k or 32k) 🙈

MISCELLANEOUS

CLOCK — A software real-time clock program for the CoCo. Warning:

The clock will stop during tape I/O

(ML, 16k or 32k) Cassette \$9.95 or Disk (With Source) \$13,95

DARKROOM DATABASE - Throw away your Photo-Lab index. Let

CoCo look up the facts. Darkroom Data-Base with timer.

(Disk. 16k or 32k)

Disk \$19.95

COMING SOON MC-10 SOFTWARE! Write for more details

CHROMA- SYSTEMS GROUP

PO Box 366

Dayton, Ohio 45420

Please include \$1 for shipping and handling per item. Onlo residents please

610]), "Celebrations" (birthdays, Christmas/Chanukah, Valentine's Day [lines 620-950]) and "Events" [lines 960-11901.

Lines 1200—1420 then ask the student to examine the printout and to select a "best" topic to write about. Students should also save the printout for future reference. Typically a student will create more than one and possibly dozens of potential writing ideas, each of which can be developed separately through Part II.

Lines 1430—end give the student the option of plunging directly into drafting a paper or, if more preparation is needed, moving on to Part II.

Part II

Lines 2000—2190 introduce this portion and ask the student to re-identify him or herself, turn on the printer and enter the topic that has been chosen.

Lines 2210—2310 have the student describe the general idea of the topic.

Lines 2320—2840 ask the writer to brainstorm for details about the topic, including Sights [2340-2450], Sounds [2460—2540], Other Senses [2550—2640], Actions [2660— 2680] and People [2760—2840].

Lines 2850—3020 focus on the audience or intended readership of the paper. Who will read it? What does the writer want them to understand?

Lines 3030—3210 ask the writer to jot down some sentences that can be used as a possible beginning, middle and ending.

Lines 3230 end conclude the program by pointing out that the writer has, in effect, planned the entire paper, that the only remaining task is drafting. The text of the program also reminds the student that people, not computers, write papers; that there is no electronic substitute for a writer.

The model provided by "The Write Idea" can be modified to treat virtually any kind of writing, from exposition and argument to letter writing or even creative writing. Unlike drill programs, it does not insist on "right" answers; rather, it uses the computer as a stimulus to creativity and as an electronic notepad. I believe programs like it deserve a place in the computer-oriented language laboratories springing up in schools and colleges all over the country. I hope such programs will replace the "old wine" of skill-and-drill programs with a richer vintage more appropriate to the new bottle of the Color Computer.

150.

390_

880_

610

01E4

04DE

_OA6E

074F

1110 __ OCE6

1400 ___102E END __ 12EO

Listing 1:

5 CLEAR 2000

10 CLS

20 PRINT @ 97. "T H E WRI

I D E A":PRINT

3Ø PRINT @ 166,"'FINDING SOMETHI

NG TO"

4Ø PRINT @ 202, "WRITE ABOUT"

50 PRINT @ 229, "FROM PERSONAL E XPERIENCE'"

60 PRINT: PRINT

STAR-KIBBITS

Welcome to the eighth of my monthly chats. This month I have several interesting topics . . . hope you think so too!

I'd like to announce that we now have software for the new MC-10 Micro Color Computer by Radio Shack. We have already shipped several copies of our MC-10 HUMBUG, and our MC-10 dumb terminal and REMOTERM programs should be available by the time you read this. Contact us for details.

I am often asked whether Star-Kits accepts outside software submissions. In the process, I often run across interesting programs which, while we can't market them, still merit your attention. So I've decided to cover the really good ones here. This month I'd like to mention one for you radio amateurs. It is a program which predicts propagation conditions between two selected locations; I've seen it work and was amazed at its versatility. It plots conditions by time of day in high resolution graphics, and even computes beam headings. It's available for \$25 from K. Middleton, P.O. Box 223, Bedford Hills, NY 10507.

Next, let's see if I can grab your attention with the magic word

REBATE!

Got your attention? Good. We are offering a rebate of \$5 on Star-Kits software priced up to \$50, and a rebate of \$10 on software priced over \$50. But there is a catch — It applies only to software purchased from a dealer. To get the rebate you must send us the User Registration Form (in your manual), properly filled out, and a copy of the dealer's sales slip or invoice. The rebate is good until December 24, 1983, so if your dealer does not yet have the program you want, there is plenty of time for him to order it for you.

Finally, I'd like to announce an

AMNESTY

I know that there are many of you out there who have acquired your Star-Kits program in a . . . ahem . . . unorthodox way. You may have an incomplete manual or old version, and most likely feel a bit guilty about it to boot.

OK, we are willing to help you sleep better. If you send in a working copy of the program you have, plus a fee of one-quarter of the list price, we will send you the latest Star-Kits manual along with an up-to-date version, and thereby make you a legitimate, registered owner. For example, to become a legitimate owner of the latest version of HUMBUG will cost you one-quarter of \$39.95, or just \$9.99.

But there is a catch — to qualify for this plan, you must provide us with complete details of where and how you got your copy of the Star-Kits program, including the name and address of the person and/or store who gave or sold it to you. You may not want to do that if you got it from a good friend, but I don't see any reason why you should hesitate if you got it from someone you don't know too well (or perhaps don't like!)

To close, I would like to introduce you to the new word Shilop, which stands for Reverse Polish Notation. Remember — you saw it here first.

SPELL 'N FIX

Regardless of whose text processor you use, let SPELL 'N FIX find and fix your spelling and typing mistakes. It reads text faster than you can, and spots and corrects errors even experienced proofreaders miss. It is compatible with all Color Computer text processors. \$69.29 in the Radio Shack disk or cassette versions; \$178.58 in the Flex version. (20,000 word dictionary is standard; optional 75,000 word Super Dictionary costs \$50 additional.)

HUMBUG — THE SUPER MONITOR

A complete monitor and debugging system which lets you input programs and data into memory, list memory contents, insert multiple breakpoints, single-step, test, checksum, and compare memory contents, find data in memory, start and stop programs, upload and download, save to tape, connect the Color Computer to a terminal, printer, or remote computer, and more. HUMBUG on disk or cassette costs just \$39.95, special 64K version for FLEX or STAR-DOS 64 costs \$59.95, MC-10 version \$29.95.

STAR-DOS

A Disk Operating System specially designed for the Color Computer, STAR-DOS is fully compatible with your present Color Computer disk format — it reads disks written by Extended Disk Basic and vice versa. STAR-DOS for 16K or 32K systems costs \$49.90; STAR-DOS 64 for 64K systems costs \$74.90.

STAR FLEX

The best implementation of FLEX for the Color Computer. Complete with all utilities, text editor, macro assembler, and HUMBUG debug monitor, \$250.00.

ALL IN ONE — Editor Etc.

Three programs in one — a full function Editor, a Text Processor and a Mailing List/Label program. All this for just \$50. Requires STAR-DOS and 32K, or STAR-DOS 64, or FLEX, specify which.

DBLS for Data Bases

DBLS stands for Data Base Lookup System. A super-fast system for searching for a selected record in a sequential disk file. Supplied with SPELL 'N FIX's 20,000 word dictionary as a sample data file—lets you look up the spelling of any word in under FOUR seconds. Priced at \$29.95. Requires STAR-DOS.

CHECK 'N TAX

Home accounting package combines checkbook maintenance and income tax data collection. Written in Basic for either RS Disk or Flex, \$50.

REMOTERM

REMOTERM — makes your CoCo or MC-10 into a host computer, operated from a remote terminal. \$19.95.

NEWTALK

NEWTALK — a memory examine utility for machine language programmers which reads out memory contents through the TV set speaker. \$20.

SHRINK

SHRINK — our version of Eliza, in machine language and extremely fast. \$15.

EDUCATIONAL SOFTWARE

Introduction to Numerical Methods — college level course on computer math, \$75.00.

We accept cash, check, COD, Visa, or Master Card. NY State residents please add appropriate sales tax.

(FLEX is a trademark of Technical Systems Consultants, Inc. Everything else in this ad is a trademark of Star-Kits.)

STAR-KITS

P.O. BOX 209 — R MT. KISCO, N.Y. 10549 (914) 241-0287 70 PRINT @ 330, "VERSION 1.4" 80 PRINT @ 358, "COPYRIGHT (C) 1 983" 90 PRINT @ 392, "STEPHEN TCHUDI" 100 PRINT @ 423, "**THE INKBYTE** 110 PRINT @ 455, "2011 PAWNEE TRA IL" 120 PRINT @ 485, "OKEMOS, MICHIGA N 48864" 130 FOR T= 1 TO 5000:NEXT T:CLS(140 PRINT "LOTS OF PEOPLE HAVE D IFFICULTY FINDING SOMETHING TO ABOUT." WRITE 150 GOSUB 1530 160 PRINT "THIS PROGRAM WILL HEL

17Ø GOSUB 153Ø

ERIENCE."

180 PRINT "ALL YOU HAVE TO DO IS PEEK AND POKE IN YOUR MEMORY T O RECALL INTERESTING EVENTS AN D PEOPLE."

P YOU FIND IDEAS IN YOUR OWN EXP

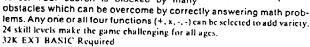
190 GOSUB 1530

200 PRINT "THE COMPUTER WILL ASK YOU A FEW QUESTIONS."

21Ø GOSUB 153Ø

GRAPHIC MATH ADVENTURE \$21.95

Challenging Adventure! Fully player selectable up to 300 "room." Search for treasure on land, on river, and in the labryinth of caves. Your search is blocked by many



BACKUP MASTER/ GRAPHIC MONITOR

SUPER powerful UTILITY allows backups to be made of any program - cassette, disk, even ROM based!!

- Over rides <u>all</u> software autostart mechanisms
 Fully relocatable will not interfer with any program
 Capable of reading many tapes which basic can't

64K USERS have extra power

- Modify basic to suit your needs
 Save copies of Basic, Ext Basic, Disk Basic, etc.
 Run address dependent ROMS from RAM

SPELLING MASTER \$14.95

Conquer spelling. Learn the words you have trouble with. User input unlimited number of words. Good for weekly spelling lists. SAMPLE list provided. 16K EXT BASIC cassette

CONCENTRATION 40 blocks hide 20 patterns. Pit your memory skills against your friends. Two players, Non-EXT BASIC casastie.

15% OFF ALL	Speciral Associates Saltwar		
examples			
Android Allack	21.05	10 65	
Cosmic Invaders	21.05 12.05	15 35	
Chost Gobbler	19-45	16 95	
Space War	23.05	16.65	
Battle Floor	23.00	18 05	
Keys of Wileid	19-45	18 65	
Space Travers	14.05	12 70	
Lothers Labyrinih	14.45	12.70	
AICBUBJ II		10.15	
Cosmic Super Bowl	15-05	12.70	
Typing Tulor	10 15	16.95	
Flex Plus Dos	69-45	58 45	
Little BOC		J	





SOFTWARE FACTORY

1333Morgan Road Bremerion, WA 98312





49.45 42 45

59Ø PRINT #-2, "

220 PRINT "PRESS (ENTER) WHEN RE ADY": INPUT G\$:CLS(6) 23Ø PRINT 240 PRINT "WHAT IS YOUR NAME?": I NPUT NAMES:PRINT 250 PRINT "OK, " NAME\$ 260 FOR T=1 TO 500:NEXT T:PRINT 270 PRINT "TURN ON YOUR PRINTER. 280 PRINT: PRINT "PRESS (ENTER) WHEN THE PRINTER IS ON." 29Ø INPUT T\$:CLS(5) 300 PRINT "WE'LL BEGIN WITH A CA CALLED: " TEGORY 310 FOR T=1 TO 500:NEXT T:PRINT 32Ø PRINT " * * F I R S T S * * " 330 GOSUB 1530 340 PRINT "THINK OF SOME OF THE 'FIRSTS' INYOUR LIFE:" 350 GOSUB 1540 36Ø PRINT " FIRST LOVE OR F IRST KISS" 370 GOSUB 1540 380 PRINT " FIRST PET FI RST DEATH" 390 GOSUB 1540 400 PRINT " FIRST DAY AT SCHOOL 41Ø GOSUB 154Ø 420 PRINT " FIRST REMEMBERED NI **GHTMARE**" 430 GOSUB 1530 44Ø PRINT "OK, GOT THE IDEA?" 45Ø GOSUB 153Ø 46Ø PRINT "PRESS (ENTER) WHEN RE ADY": INPUT G\$: CLS(Ø) 47Ø PRINT 480 PRINT "NOW LIST ONE OF THE ? FIRSTS' IN YOUR LIFE. THEN PRESS <ENTER>." 49Ø PRINT 500 INPUT S\$ 510 PRINT #-2, CHR\$(31); "SOME " FIRSTS' IN THE LIFE OF ": PRINT #-2, NAMES:PRINT #-2 520 PRINT #-2, " ***" S\$:PRINT 530 PRINT: PRINT: PRINT "GOOD" 540 GOSUB 1540: CLS(0) 550 PRINT "NOW LIST ANOTHER FIRS T IN YOUR LIFE. <ENTER> (IF YO U'RE OUT OF 'FIRSTS', PRESS <XXX ENTER>.) 56Ø PRINT 57Ø INPUT S\$ 580 IF S\$="XXX" THEN 620 ***" S\$:PRINT

600 PRINT:PRINT:PRINT "KEEP GOIN

Dealer & Author inquiries invited

G":FOR T = 1 TO 500: NEXT T61Ø GOTO 54Ø 620 PRINT "OK, " NAMES: PRINT "LE T'S TRY ANOTHER CATEGORY" 63Ø FOR T=1 TO 5ØØ:NEXT T:CLS(2) 640 FOR T=1 TO 200:NEXT T: PRINT 65Ø PRINT " * * C E L E B R A T I O N S * *" 66Ø GOSUB 153Ø 670 PRINT "LIST SOME OF THE MOST IMPORTANT CELEBRATIONS IN YOUR LIFE." 680 FOR T = 1 TO 1000:NEXT T:PRI NT 69Ø PRINT " FIRST REMEMBERED BIR THDAY" 700 GOSUB 1540 710 PRINT " OTHER BIRTHDAYS UN BIRTHDAYS" 720 GOSUB 1540 73Ø PRINT " CHRISTMAS CHANUKKA" 74Ø GOSUB 154Ø 75Ø PRINT " JULY 4TH VALEN TINES DAY" 76Ø GOSUB 154Ø 78Ø GOSUB 154Ø 790 PRINT " ? ! ? GROUND HOG'S D AY ! ? !" 800 GOSUB 1530 810 PRINT "OK? PRESS (ENTER) WHE N READY. ": INPUT G\$:CLS(8) 820 FOR T = 1 TO 500:NEXT T:PRIN 830 PRINT "NOW LIST ONE OF THE C ELEBRATIONSIN YOUR LIFE. THEN PR ESS (ENTER)" 84Ø INPUT P\$ 850 PRINT #-2, "CELEBRATIONS IN THE LIFE OF":PRINT #-2, NAME\$:PR 86Ø PRINT #-2," ***" P\$:PRINT #-2 870 PRINT: PRINT: PRINT "THAT GETS YOU STARTED" 880 GOSUB 1540: CLS(8) 890 PRINT "NOW LIST ANOTHER CELE BRATION IN YOUR LIFE. <ENTER>" 900 PRINT:PRINT "(PRESS <XXX ENT ER> IF YOU'RE OUT OF IDEAS." 91Ø INPUT P\$ 920 IF P\$="XXX" THEN 940 ***"P\$:PRINT # 930 PRINT #-2." -2 95Ø GOTO 88Ø 960 CLS(2):PRINT: PRINT "LET'S D

The Color Computer Word Processor!

MASTER WRITER (we changed our name from WORDMASTER) is a professional quality full screen oriented word processor for your color computer. Take a look at what you get.

MASTER WRITER'S FULL SCREEN-ORIENTED EDITOR allows you to move the cursor anywhere in your text using the up, down, right and left arrows. Do this one character at a time or by line or page. Insert, delete or replace text at the cursor watching your changes as you make them. Delete or move blocks of text from one place to another. Merge in text from other files.

AUTOMATIC CARRIAGE RETURN after last complete word on each line; with this and AUTOMATIC PAGE FEED you don't have to worry about where a line or page ends — just type!

MASTER WRITER runs on a 16K, 32K, or 64K color computer, taking advantage of all available memory. Use it with DISK OR CASSETTE based systems. EXTENDED BASIC IS NOT REQUIRED for cassette version.

EASY TO UNDERSTAND MANUAL has you comfortably using MASTER WRITER in minutes. It is a USER-FRIENDLY MENU-DRIVEN SYSTEM with single letter commands. Check any command without having to refer to the manual with the HELP SCREEN.

10 PROGRAMMABLE FUNCITON KEYS allow easy insertion of frequently used words or phrases.

WORKS WITH ANY PRINTER. Take full advantage of your printer's special functions such as variable character size and emphasized characters with EASY EMBEDDING OF PRINTER CONTROL CODES.

GLOBAL SEARCH function lets you quickly locate specific strings for replacement or deletion.

Customize form letters or standard text with the EMBEDDED PAUSE feature. Just "fill in the blanks" when your printer pauses for a personalized appearance. LIMITED MULTI-TASKING feature lets you print one file while editing another.

In addition to regular text you can use **MASTER WRITER** to **CREATE BASIC PROGRAMS** with the convenience of full-screen editing. It can also be used to make and edit simple **MAILING LISTS**.

OTHER FEATURES include easy setting of left, right, top and bottom margin, printer line width, and lines per page. Also repeat keys, auto line centering, auto page numbering and choice of display color formats.

TO ORDER send \$29.95 for cassette version or \$34.95 for disk version plus \$2.50 shipping (Calif. residents add sales tax) to: PYRAMID DISTRIBUTORS, 527 HILL ST., SANTA MONICA, CA 90405 (213) 399-2222.

MASTER WRITER \$29.95 Cassette \$34.95 Disk

O ONE MORE CATEGORY." 980 FOR T = 1 TO 250:NEXT T:PRIN 99Ø PRINT " * * E V E N T S * * " 1000 GOSUB 1530 1010 PRINT " OR" 1020 GOSUB 1530 1030 PRINT " * * HAPPENI NGS * * " 1040 GOSUB 1530 1050 PRINT "BY NOW YOU KNOW THE GAME, SO BE-GIN LISTING IMPORTAN T EVENTS IN YOUR EXPERIENCE." 1060 GOSUB 1530 1070 PRINT "TYPE IN AN IMPORTANT EVENT": PRINT 1080 INPUT ES 1090 PRINT #-2, "EVENTS IN THE LI FE OF": PRINT #-2, NAMES:PRINT # 1100 PRINT #-2, " ***" E\$:PRIN T #-2 1110 GOSUB 1540:CLS(2) 1120 PRINT: PRINT "OK, " NAME\$ 113Ø PRINT: PRINT "NOW LIST ANOT HER EVENT": PRINT 1140 PRINT "PRESS (ENTER) WHEN F

COLOR-FORTH

Including <u>SEMIGRAPHIC-8</u> EDITOR + UTILITIES

- -Disk and Tape utilities
- -Boot from disk or tape
- -Graphics and Sound commands
- -Printer commands
- -Auto-repeat and Control keys
- -Fast task multiplexing
- -Unique TRACE function in kernal
- -Clean INTERRUPT handling in HIGH-LEVEL FORTH
- -CPU CARRY FLAG accessible
- -Game of LIFE demo
- -ULTRA FAST: written in assembler
- -Directions included for
- installing optional ROM in
- disk controller or cartridge
- -Free Basic game "RATMAZE"

\$58.95

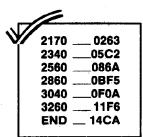
FORTH

HOYT STEARNS ELECTRONICS
4131 E. CANNON DR. PHOENIX, ARIZONA 85028
602-996-1717

3Ø

INISHED": PRINT 1150 PRINT "IF YOU'RE OUT OF IDE AS, PRESS <XXX ENTER>" 116Ø INPUT E\$ 117Ø IF E#= "XXX" THEN 12ØØ 1180 PRINT #-2, " ***"E\$:PRINT #-2 119Ø GOTO 111Ø 1200 CLS(4) 1210 PRINT: PRINT "THAT'S THE END OF THE IDEA GATH-ERING. ": GOSUB 122Ø PRINT "NOW LET'S PICK A TOP IC TO WRITE ABOUT.": GOSUB 153Ø 123Ø PRINT "TAKE A LOOK AT YOUR PRINTOUT."" 124Ø GOSUB 153Ø 1250 PRINT "WHICH OF THE IDEAS O N THE PRINT-OUT ARE MOST INTERES TING TO YOU?":GOSUB 153Ø 1260 PRINT "PRESS (ENTER) WHEN R EADY TO PRO-CEED. ": INPUT G\$:CLS(129Ø CLS(4) 1300 PRINT: PRINT "OF ALL THOSE I DEAS, WHICH ONE IS THE MOST APPE ALING TO YOU?": GOSUB 1530 133Ø PRINT 134Ø PRINT "IT WILL MAKE A GREAT WRITING IDEA!":GOSUB 1530 1350 PRINT "TYPE IN THE TOPIC.": PRINT 1360 INPUT T\$ 1370 PRINT #-2, CHR\$(31); "THE T OPIC SELECTED BY " NAME\$ " IS:" 1380 PRINT #-2:PRINT #-2, " " T\$ 1390 CLS(4):PRINT "GOOD, " NAME\$ 1400 GOSUB 1530 1410 PRINT "THE TOPIC YOU'VE PIC KED IS:" 142Ø GOSUB 153Ø 1430 PRINT " "T\$:GOSUB 1530 1440 PRINT "YOU MAY FEEL READY T O WRITE ABOUT IT RIGHT NOW." :GOSUB 153Ø 1450 PRINT "IF SO, SAVE YOUR PRI NTOUT, ": GOSUB 1540 146Ø PRINT " POP IN THE WORD PROCESSING CARTRIDGE, ": GO SUB 1540 147Ø PRINT " AND START DRAFTING.":GOSUB 153Ø 148Ø PRINT "IF NOT, PRESS <ENTER >":INPUT G\$:CLS(4) 1490 PRINT "IF YOU WANT MORE HEL P BEFORE WRITING, ": GOSUB 1530 1500 PRINT "LOAD THE NEXT PROGRA P BEFORE M ON THE CASSETTE. ": GOSUB 15

1. PRESS <BREAK>." 15Ø1 PRINT " TYPE (NEW ENTER 1502 PRINT 1503 PRINT " 3. PREPARE RECORDE R TO <PLAY>" 4. TYPE <CLOAD ''I 1504 PRINT " DEAS 2 '' ENTER>." 1510 PRINT & 426. "**THAT'S ALL FOR NOW" 1520 GOTO 1520 1530 FOR T = 1 TO 1500:NEXT T:PR INT: RETURN 1540 FOR T=1 TO 1000:NEXT T:RETU



Listing 2:

RN

2000 CLEAR 2000 2010 CLS 2020 PRINT @ 97,"T H E WRI I D E A" TE 2030 PRINT @ 172, "PART TWO" "'DEVELOPING Y 2040 PRINT @ 225. OUR WRITING IDEA?" 2050 PRINT @ 330, "VERSION 1.3" 2060 PRINT @ 358. "COPYRIGHT (C) 1983" 2070 PRINT @ 392, "STEPHEN TCHUD 2080 PRINT @ 423, "**THE INKBYTE* 2090 PRINT @ 455, "2011 PAWNEE T RAIL" 2100 PRINT @ 485, "OKEMOS, MICHIG AN 48864" 2110 FOR T = 1 TO 5000:NEXT T:CL S(5) 2120 FOR T = 1 TO 500: NEXT T213Ø PRINT: PRINT "I REGRET TO SA Y I HAVE FORGOTTENYOUR NAME.":GO SUB 343Ø 2140 PRINT "PLEASE ENTER IT AGAI N":PRINT:INPUT NAME\$:GOSUB 343Ø 2150 PRINT "THANK YOU, " NAMES:G **OSUB 3430** 2160 PRINT "IN OUR LAST EPISODE YOU PICKED AWRITING TOPIC. PLEAS E LIST THAT TOPIC:" 217Ø PRINT: INPUT T\$: CLS(5) 218Ø PRINT "THANKS AGAIN.": PRINT : PRINT"PLEASE MAKE CERTAIN YOUR PRINTER IS TURNED ON. ":PRINT 219Ø PRINT "PRESS (ENTER) TO PRO

Compuesette® TAPES & DISKS

100% ERROR-FREE



The Micro-Trac[™] Generation

Used by Software Firms & Computer Hobbyists Choice of School Districts Nationwide

0100====	MINI	STANDARD
CASSETTES	12-PAK	24-PAK
C-05\$.79	\$.59
C-10\$.89	\$.69
C-20\$.99	\$.89
C-30\$	1.29	\$1.09
Custom Cases \$.26	\$.21
Cases recommended to protes	t sensitive	cassettes.

51/4" DISKETTES		STANDARD 10-PAK*
Soft Sector		
Single Sided		
S/D Density	\$14.95	\$26.95

*10 PAK w/custom library case, add \$3.00
— UPS SHIPPING —

(No. P.O. Boxes please)

\$3.00 per pack

Canadian shipping multiply by 2 —

No. 1 Magnetic Media in the USA!

Write for volume prices —
 TOLL-FREE

(orders only)



1-800-528-6050 ext. 3005 In Arizona State 1-800-352-0458 ext. 3005



MICRO-80 ™ INC.

E. 2665 Busby Road Oak Harbor, WA 98277 1 (206) 675-6143



ATLANTIS ADVENTURE

This one is tough! We challenge you to complete this in 30 days. If you can we will send you any cassette program we sell at no charge. (We will even pay the postage.) You start on a disabled sub, near the lost city of Atlantis. Your object is to get the sub and yourself safely to the surface. Your text adventure tape will have a 16K EXT version on one side and a 32K EXT version on the other.

ATLANTIS Cassette - Postpaid

\$21.95

PROGRAM FILE



Organize your cassette programs. Let your computer find that program for you. Create and maintain a four field file. You can search, sort, modify, delete and display on screen or printer. Sorting may be done by name, type, or location. You may sort on all three fields with a single sort.

Cassette 16K EXT - Postpaid

\$14.95

LABEL III



Develop and maintain a mailing list. Print lists or labels in your choice of 1, 2 or 3 wide. Supports 3 or 4 line addresses with phone optional. Fast machine language sort on last name, first name, or zip code. You may sort on all three fields with a single sort.

Cassette 16K EXT - Postpaid

NEW!!

Now you can add a little light and extend your coco's life. Don't leave your coco on and fry your chips. Put some lite in your coco's life. "OWLS EYE" indicator light plugs into either joystick port and may he mounted beside your key-board where it is easily visible. It will glow BRIGHTLY when-ever your coco is on. Very simple 10 second installation! "OWLS EYE" - Postpaid

DISASSEMBLER - ASSEMBLER

(By Dynamic Electronics) Designed for the beginner who wants to learn to write machine language programs.

16K NON EXT Cassette - Postpaid

\$19.95

CASSETTE TAPES C-05

\$7.50 - Dozen / \$9.50 - Dozen with hard boxes. Please add \$1.50 per dozen shipping and handling for blank cassette tapes.

> C.O.D. Orders Please Add \$1.50 No Delay for Personal Checks





OWLS NEST SOFTWARE

Ooltewah, TN 37363

P.O. Box 579

CEED. ": INPUT G\$:CLS(8) 2200 PRINT: PRINT "OK, " NAME\$ 2210 PRINT "PLEASE TELL ME A LIT TLE ABOUT" 222Ø PRINT T\$ 223Ø GOSUB 343Ø 2240 PRINT "PLEASE TYPE IN SOME **PHRASES** ABOUT IT. ": PRINT 225Ø PRINT "(P.S. DON'T USE PUNC MARKS. I CAN'T DIGES TUATION T THEM.) ": PRINT 2260 PRINT "(PRESS (ENTER) WHEN FINISHED.) 227Ø PRINT: INPUT INFO\$ 228Ø PRINT #-2, CHR\$(31); "SOME WRITING IDEAS DEVELOPED BY ":PRI NT #-2," " NAMES: PRINT #-2 229Ø PRINT #-2, "THE TOPIC IS: :PRINT #-2," "T\$: PRINT #-2 2300 PRINT #-2, "THE GENERAL IDE A OF THE PAPER WILL BE: ":PRINT " INFOs:PRINT #-2 2310 GOSUB 3430:CLS(2) 2320 PRINT: PRINT "ONE OF THE MO ST IMPORTANT THINGSABOUT WRITING IS TO BE SPECIFIC, TO USE LOTS O F EXACT DETAILS.": GOSUB 3430 2330 PRINT "LIST SOME DETAILS AB OUT YOUR SUBJECT. ": GOSUB 3430:C LS(2) 2340 PRINT "FOR EXAMPLE, LIST SO ME OF THE 'SIGHTS' ABOUT IT. W HAT SHOULD YOUR READER SEE?" 2350 PRINT: PRINT "LIST A SIGHT OR 'VISUAL DETAIL.'":PRINT 2360 INPUT S\$ 2370 PRINT #-2, "SOME DETAILS AB OUT THE TOPIC: ": PRINT #-2 238Ø PRINT #-2. " ***SIGHTS:": PRINT #-2 239Ø GOSUB 345Ø 2400 PRINT: PRINT "GOOD BEGINNIN G": GOSUB 3430: CLS(2) 2410 PRINT "NOW LIST ANOTHER SIG HT": PRINT 2420 PRINT "(OR PRESS <XXX ENTER >IF YOU'VE FINISHED)" 243Ø INPUT 5\$ 2440 IF S\$="XXX" GOTO 2460 ELSE GOSUB 345Ø 245Ø CLS(2):GOTO 241Ø 2460 CLS(2):GOSUB 3430:PRINT "NO W LIST SOME SOUNDS OR NOISES:" 247Ø PRINT #-2, " ***SOUNDS":P RINT #-2 248Ø PRINT:PRINT "PRESS (ENTER) AFTER EACH SOUND.":PRINT 249Ø PRINT "PRESS <XXX ENTER> WH EN FINISHED.":PRINT 2500 INPUT S\$

2510 IF S\$= "XXX" THEN 2540 252Ø GOSUB 345Ø 253Ø CLS(2):GOTO 248Ø 254Ø CLS(3):PRINT 255Ø PRINT "THINK OF OTHER DETAI LS USING THE SENSES.": GOSUB 344Ø 256Ø PRINT " SMELLS? TASTES? FEELING?" 257Ø PRINT #-2, ***OTHER SEN SES":PRINT #-2 258Ø PRINT "LIST SOME SENSORY DE TAILS. ": PRINT 259Ø PRINT "PRESS (ENTER) AFTER EACH DETAIL. ": PRINT 2600 PRINT "PRESS < XXX ENTER> WH EN FINISHED": PRINT 261Ø INPUT 5\$ 262Ø IF S\$="XXX" GOTO 265Ø 2630 GOSUB 3450 264Ø CLS (3):GOTO **258**Ø 265Ø CLS(4): PRINT 266Ø PRINT "THINK ABOUT ACTIONS (OR VERBS IFYOU TALK 'GRAMMAR'). ":PRINT 267Ø PRINT #-2. " ***ACTIONS": PRINT #-2 268Ø PRINT "LIST SOME ACTIONS FO R YOUR WRIT-ING IDEA.":PRINT 269Ø PRINT "PRESS <ENTER> AFTER EACH ONE.": PRINT 2700 PRINT "OR <XXX ENTER> TO MO VE ON.":PRINT 271Ø INPUT S\$ 272Ø IF S\$="XXX" THEN 275Ø 273Ø GOSUB 345Ø 274Ø CLS(4):GOTO 268Ø 275Ø CLS(5):PRINT 276Ø PRINT "AND NOW LIST PEOPLE. ":GOSUB 343Ø 2770 PRINT #-2, " ***PEOPLE": PRINT #-2 278Ø PRINT "WHO ARE THE MAIN 'CH IN THIS 'DRAMA'?":PR ARACTERS? INT 279Ø PRINT "PRESS (ENTER) AFTER OR <XXX ENTER> TO MO EACH NAME VE ALONG. ": PRINT 2800 INPUT S\$ 2810 IF S\$="XXX" THEN 2840 282Ø GOSUB 345Ø 283Ø CLS(5):GOTO 279Ø 284Ø CLS(6):PRINT 285Ø PRINT "EVERY COMPOSITION AS AN AUDIENCE--":GOSUB 34 3Ø 2860 PRINT " THE PEOPLE WHO RE AD IT.": GOSUB 3430 287Ø PRINT "THINK OF THE AUDIENC

E FOR THIS

PAPER."

288Ø FOR T=1 TO 15ØØ:NEXT T:CLS(289Ø PRINT "WHO WILL READ IT?":G OSUB 343Ø 2900 PRINT " FRIENDS?": GOSUB 3440 291Ø PRINT " FAMILY?":G **OSUB 3440** 292Ø PRINT " CLASS MATES?": GOSUB 344Ø 293Ø PRINT " TEACHER?":GOSUB 3430 2940 PRINT "DESCRIBE YOUR AUDIEN CE":PRINT: PRINT"PRESS <ENTER> W HEN FINISHED." 295Ø INPUT A\$ 2960 PRINT #-2, "THE AUDIENCE FO R THIS PAPER IS: ": PRINT #-2, " As: PRINT #-2 297Ø CLS(6) 298Ø PRINT "IN A FEW WORDS, TELL WHAT YOU'D LIKE THEM TO LEARN O R UNDERSTANDFROM YOUR WRITING.": PRINT 299Ø PRINT "PRESS (ENTER) WHEN F INISHED." 3000 INPUT U\$ 3Ø1Ø PRINT #-2, NAME\$ " WOULD LI KE THE AUDIENCE TO LEARN OR UNDE

STAT'S **EXPANDED**

a STATISTICAL ANALYSIS PROGRAM, THAT CALCULATES-MEAN, -- VARANCE, AND STANDARD DEVIATION FOR BOTH SAMPLES OF POPULATION PERMUTATION AND COMBINATIONS, F and T TEST, CURVE FITTING, LINEAR, EXP., LOG., POWER EAST MODIFICATION OF STORED DATA, COMBINE TWO FILES, ETC. USER FRIENDLY! CASSETTE \$24.95

COLOR GRAPIC PRINTER UTILITES

UTILITES FOR RADIO SHACKS COP-115, COLOR GRAPIC PRINTER/PLOTTER
HORD PROCESSOR--SUPPORTS EMBEDDED CONTROLS FOR PRINT SIZE OR COLOR
RIGHT JUSTIFICATION, DESIGNED JUST FOR THE COP-115

SCREEN PRINT PROGRAP---TRUE FOUR COLOR PRINT OUT, WORKS IN PRODE 3 OR 4 YOU WON'T BELEVE THE DETAILS

DRAWING BOARD---ETCH-A-SKETCH FOR THE PRINTER, ANY COLOR, EAST CORRECTIONS CASSETTE \$24.95

CASSETTE \$24.5

RELOCATE

RELOCATE MAKES AUTOMATIC TAPE COPIES OF ANY COLOR COMPUTER CARTRIDGE. ALLOUS CHANGES TO BE MADE TO THE PROGRAM SUCH AS PERINT-OUT MUIDEDTEX. CHANGE BRUD RATE IN MSCRIPSIT. ECT. I REQUIRES EITHER A 64K MOD. OR A 16K OR LARGER COMPUTER WITH A CARTRIDGE MEMORY EXPANSION OF 4K OR LARGER. VERY EASY TO USE? ONCE FARILIAR WITH THE PROGRAM, COPIES ON BE MADE IN LESS THEN FOUR MINUTES

COMPTERIZED ALARM SYSTEMS

LET COCO WATCH YOUR HOUSE WHILE YOU ARE AWAY, LESS THAN TWENTY DOLLARS OF RADIO SHACK COMPONENTS, PLANS AND SOFTWARE. WRITE FOR DETAILS

CIHIS AD ITPESET WITH THE COLOR GRAPIC PRINTER)

RANSTION ECHNOLOGY 1458 W. BIRCHWOOD AVE. CHICAGO IL 60626

18K-UIN STESTEN PLEASE SPECIFT

\$1,50 SHIPING AND HANDLING C.O.D. EXTRA

*TANDY Corp

RSTAND: ": PRINT #-2, " "U\$:PRI NT #-2 3020 CLS(7): PRINT 3030 PRINT "IMAGINE YOU WERE TAL SOMEONE IN THAT AUDI ENCE.":GOSUB 343Ø 3040 PRINT "YOU ARE GOING TO TEL L THAT PER- SON YOUR STORY.": GOS 3Ø5Ø PRINT "HOW WOULD YOU BEGIN? ":GOSUB 343Ø 3060 PRINT "TYPE IN YOUR OPENING WORDS.":PRINT 3070 PRINT "THEN PRESS <ENTER>" 3080 INPUT W\$ 3090 PRINT #-2, "A GOOD BEGINNIN G MIGHT BE: ":PRINT #-2," " W\$:PRINT #-2 3100 CLS(7): PRINT 311Ø PRINT"WHAT NEXT?": GOSUB 34 3120 PRINT "WHAT WOULD YOU TELL THEM NEXT?": GOSUB 343Ø 3130 PRINT "TYPE IT IN. PRESS <E NTER> WHEN DONE. ": PRINT 314Ø INPUT M\$ 315Ø PRINT #-2, "NEXT WOULD COME : ": PRINT #-2, " "M\$: PRINT # 316Ø CLS(7):PRINT 3170 PRINT "AND WHERE WOULD YOU END?": GOSUB 3430 318Ø PRINT "WRITE DOWN HOW YOUR STORY ENDS": PRINT: PRINT "PRESS <ENTER> WHEN FINISHED." 319Ø INPUT E\$ 3200 PRINT #-2, "AND IT MIGHT EN D LIKE THIS: ": PRINT #-2, " E\$ 3210 CLS(8):PRINT 3220 PRINT "OK, " NAME\$

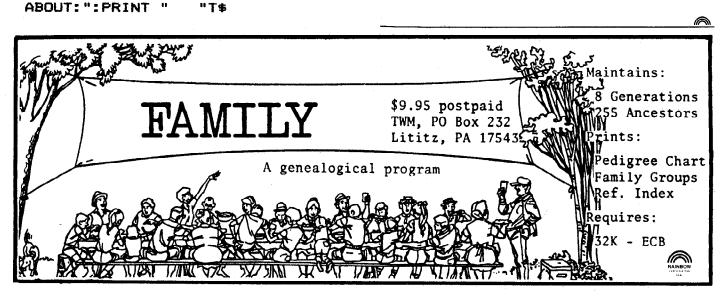
3230 PRINT "YOU'VE TOLD ME A LOT

324Ø GOSUB 343Ø 325Ø PRINT "YOU'VE LISTED SPECIF IC DETAILS: ": GOSUB 343Ø 326Ø PRINT " SIGHTS SOUNDS": GOSUB 343Ø 327Ø PRINT " ACTIONS PEOPLE": GOSUB 343Ø 3280 PRINT "YOU'VE DESCRIBED YOU R READERS.": GOSUB 343Ø 3290 PRINT "AND YOU'VE TOLD ME A BOUT YOUR BEGINNING, MIDDLE, A ND ENDING." 3300 GOSUB 3430 331Ø PRINT "PRESS <ENTER>. ": INPU T G\$:CLS(2) 332Ø PRINT @ 224, "* * * IT'S TI ME TO WRITE! * * *" 333Ø FOR T = 1 TO 2000: NEXT T 334Ø CLS (2):PRINT 3350 PRINT "USE YOUR PRINTOUT AS A GUIDE.": GOSUB 3430 3360 PRINT "YOU'VE PLANNED YOUR WHOLE PAPER": GOSUB 343Ø 3370 PRINT "IF YOU ARE USING A W ORD PROCESS-OR, PLUG IN THE CARTR IDGE AND BE-GIN DRAFTING. ": GOSUB 343Ø 338Ø PRINT "OTHERWISE, USE THAT GOOD OLD WORD PROCESSOR: ": GOS UB 343Ø 339Ø PRINT " PENCIL & PA PER." 3400 GOSUB 3430 341Ø PRINT "********GOOD LUCK ********* 342Ø GOTO 342Ø 3430 FOR T = 1 TO 1000:NEXT T:PR INT: RETURN 3440 FOR T=1 TO 500:NEXT T:RETUR

345Ø PRINT #-2, "

T #-2: RETURN

" S\$:PRIN

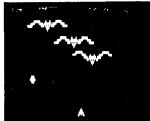


- COMPUTER SHACK -









SELD By Jeffrey Sorensen and Philip MacKenzie



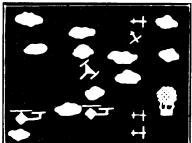
THE NEW ARCADE SMASH

The end is near, the demonic forces have invaded our galaxy. It is up to you to defend the galaxy from destruction. At your command is a powerful star cruiser equipped with high-energy missiles and defensive shields. Only with practive and patience will you be able to defeat the many waves of demon attacks and reach the three special challenge levels that will test your mental and physical dexterity.

DEMON SEED (32K)\$27.95/\$29.95

Sound S

COLOR FURY



by Tim Purves

The skies the limit in this action packed, airborne, dog fight simulation. All alone, you're surrounded by enemy fighters. Dodge behind a cloud and come out shooting! You'll be passed by paratroopers and tri-fighter forces. Destroy 'em all, and don't

spare the ammo. This is a life and death struggle with only one victor!!!

The battle takes place in the air! The enemy attacks with everything they've got, airplanes, helicopters, hot air balloons, paratroopers and magnetic air mines.

COMPUTER SHACKS second Color game promises to be another winner! With its own voice (A real talker!!!) and sound. COLOR FURY has the action and all out fun that you've come to expect from the industries leading TRS-80 software publisher.

TAPE/DISK (32K) \$27.95/\$29.95



COLOR OUTHOUSE

Computer Shack presents the wildest, funniest, all out originalist game ever published for the TRS-80 Color Computer, Color Outhouse. In this fun filled arcade game you must guard your outhouse against a

band of notorious toilet paper thieves. And if that isn't enough, we've got some of the craziest vandals you've ever seen. Bright colorful graphics, wonderful sound (very discriptive), and most of all, a lot of fast and furious fun. This'll most definitely be one to show your friends!!!

COLOR OUTHOUSE (32K).....\$27.95/\$29.95



COMPUTER SHACK

1691 Eason
Pontiac, Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8881

Master Charge and VISA OK. Please add \$3.00 for shipping in the U.S.A. \$5.00 for Canada or Mexico Proper postage outside of U.S. - Canada - Mexico

Dealers: We are distributors for all items in this ad. Write for our catalog and price list CH 118



- COMPUTER SHACK -



BALLOON ATTACK

by Tim Purves

Computer Shack's first color game is something totally different from the normal. It is not only a great game with plenty of action and adventure, but within the Balloon package, we are offering you an exceptional

learning tool. The game comes with a complete commented printout of the entire source code. In fact if you buy the disk version you could load the source code into the Micro Works Assembler and reassemble portions of it yourself.

The grane is written in the Hi Res P mode 3, contains routines showing sound, hi res graphics, excellent color, Joy stick commands, interrupt handling and much more.

Available either on Disk or Tape for the TRS-80 Color Computer. With the commented, machine language, source code you will have a chance to see, step by step, exactly how the game was written and executed. Take advantage of this new concept to improve your programming skills. For those just learning machine language, or even experts who are looking for new and helpful tips.

The game is about a mad bomber flying in his red balloon, dropping bombs on unwary pedestrians. You can run and dodge the bombs, but to no avial he'll eventually get you, its just a matter of time!!

GAME CASSETTE ONLY			\$21.95
GAME DISK ONLY			
GAME CASSETTE WITH COM	MMENTED C	ODE	\$31.95
DISK with GAME, SOURCE C			
& COMMENTED CODE			\$35.95

DFT II

Now the second version of DFT. New, improved, still the only terminal program for the color computer that can transfer machine language programs without any conversion routines.

DFT was made to transfer files between Model I/III's converted to the color computer and it is the best modem program available for transfering files, you can transfer a basic Model III program to the color computer and run it. All tokens are automatically converted.

New ASCII transmit and receive mode. Now you can transfer files and talk to people who don't have DFT.

The greatest value in Terminal Programs... Now only \$25.95 Disk or Tape version.

CIII

by Tim Purves

You can finnally use your Radio Shack Color Computer disk's in a Model I, Model III, or even a Model IV system. From Comuter Shack, the development of a fantastic new software break through has been brought about. CIII (pronounced c3), a simple software package that makes color Computer disks compatible with other TRS-80's. Now you can copy programs and data files from machine to machine with no messy conversions or trouble-some retyping.

Much like a VFU utility, simple insert your Color Disk in any 2 drive model I, III, or IV system and select the files you wish to transfer. It's that easy! And think of the uses. Word Processor files, Basic programs, Machine language, and much more can be copied from a Model I/III disk to or from your Color Computer disk in a matter of seconds. CIII, from now on life is gonna be a lot easier!!! Compatible with most Model I/III operating systems.

Price is \$24.95 for the Model I/III or 4 disk.

COMPUTER SHACK'S TOP FIFTEEN

1, COLOR FURY	Computer Shack
2. ZAXXON	DataSoft
3. THE KING	, Tom Mix
4. COLORPEDE	IntraColor
5. ROBOTTACK	IntraColor
6. SEA DRAGON	Adventure Int.
7. WHIRLYBIRD RUI	N Spectral
8. OUTHOUSE	Computer Shack
9. GRABBER	Tom Mix
10. TRAPFALL	Tom Mix
11. NINJA	Programmers Guild
12. MOON HOPPER	Computerware
13. DOODLEBUG	Computerware
14. BLOC HEAD	Computerware
15. ZAKSUND	Elite

NOTE: Due to the fact we can not obtain tape versions of Zaxxon and Outhouse some of the members of the panel have not seen them. Lancer and Whirly Bird Run likewise have not been evaluated by the entire panel.

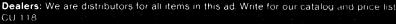


COMPUTER SHACK

1691 Eason • Pontiac Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8881

 $Master Charge \ and \ VISAOK. Please \ add \ S3.00 for shipping in the U.S.A. \ S5.00 for Canada \ or \ Mexico. Proper postage outside of U.S. - Canada \ - Mexico.$





- COMPUTER SHACK -

Mail Order...Computer Shack has been in the mail Order computer products business for 3 years. We try very hard to please everyone. In the past year we have shipped out over 90% of our orders within 24 hours. The 10% we didn't fill was because other manufacturers were not as prompt at filling orders as we were and we ran out of a product.

If you order 2 or more programs you can deduct 10% from you total software purchase. Order 3 and take 15% off and if you order 4 or more you can take 20% off the entire SOFTWARE order.

If you have tried mail order and were dismayed to find that even companies that guaranteed delivery took weeks and weeks to deliver a product don't dismay try us. We want to be your supplier.

We even have a toll free order line answered by one of our staff. Most of our staff have their own color computers so they can better help you in your selections.

COLOR COMPUTER PRICES

QUEST - Aardvark	ROBOTTACK - Intracolor24.95
GOLF - Aardvark	COLORPEDE - Intracolor
DUNGEONS OF DEATH - Aardvark	MARK DATA KEYBOARD - Mark Data
VENTURER - Aardvark	MONKEY KONG - Med Systems24.95
WIZARDS TOWER - Aardvark	EDITOR ASSEMBLER - Micro Works
SEA DRAGON - Adv. Intntl	WHIRLYBIRD RUN - Spectral
LUNAR ROVER PATROL - Spectral (32K)	GHOST GOBBLER - Spectral
OUTHOUSE - Computer Shack	MS GOBBLER 32K - Spectral
8 BALL - Anteco	DISASSEMBLER - Spectral
SPEAK UP - Classical29.95	PLANET INVASION - Spectral
TELEWRITER - 64 - Cognitec	SPACE RACE - Spectral
COLOR DFT-TAPE - Computer Shack	LANCER - Spectral
BALLOON ATTACK - Computer Shack	COLORCOM/E - Spectrum
64K UPGRADE - Computer Shack	THE COMPOSER - Speech Systems
CIII - Computer Shack	
BALLOON ATTACK COMMENTED - Computer Shack31.95/35.95	DEMON SEED - Computer Shack
COLOR DFT DISK - Computer Shack	THE FROG - Tom Mix
FURY 32K - Computer Shack	GRABBER - Tom Mix
MOON HOPPER 32K - Computerware	DISK TO TAPE - Tom Mix
SYNTHER-7 - Computerware	FIXER - Tom Mix
SHARK TREASURE - Computerware21.95/25.95	WORD DRILL 16K EXT Tom Mix
BLOC HEAD - Computerware	TEACHERS DATABASE 32K - Tom Mix
GRAN PRIX 32K - Computerware	SPACE SHUTTLE 32K - Tom Mix
SCREEN EXPANDER 64K - Computerware	MATH DRILL 16K EXT Tom Mix
DOODLE BUG - Computerware	SPELL TEST 16K EXT Tom Mix
FROGGER - Cornsoft	
ZAXXON 32K - Datasoft	TAPE TO DISK - Tom Mix
MOON SHUTTLE 32K - Datasoft	W
RAM SLAM 4K-16K - DSL	C.C. WRITER • Trans Tec
RAM SLAM 16K-32K - DSL	C.C. FILE - Trans Tec
ZAKSUND - Elite Software	C.C. CALC - Trans Tec
MADAM ROSA'S - Gamester15.00	C.C. MAILER - Trans Tec19.95
WET T-SHIRT CONTEST - Gamester	ELITE CALC - Elite

BOOKS BOOKS BOOKS BOOKS BOOKS BOOKS BOOKS BOOKS BOOKS BOOKS

ASSEMBLY LANGUAGE GRAPHICS FOR THE TRS- 80 COLOR COMPUTER

by Don Inman \$14.95

Written specifically for the TRS-80 color computer, this book uses sound and graphics to show how 6809 assembly language can be used to perform tasks that would be difficult or impossible with BASIC. All of the explanations are hands-on, so that the manual can serve as a tutorial.

TRS-80 COLOR PROGRAMS

by Tom Rugg and Phil Feldman \$19.95

Here are 37 fully documented programs ready to type into your color computer. These programs promise to be educational, practical, and in almost all cases, fun. 332 pages.

PROGRAMMING THE 6809

by Rodney Zaks & William Labiak

\$14.95

This book explains how to program the 6809 in assembly language, covering all aspects progressively and systematically. Beginning with the basics of programming. **Programming the 6809** goes on to explain registers and buses, subroutines, the 6809 instruction set, addressing modes, I/O techniques and devices, and finally, data structures.

TRS-80 COLOR COMPUTER GRAPHICS

by Don Inman

\$14.95

Explore the creative and imaginative blending of computers and color using Color Computer Graphics. This book will enable you to explore all the graphics capabilities of Extended Basic. The book also provides application programs and useful subroutines. 303 pages.



COMPUTER SHACK

1691 Eason • Pontiac, Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8881

Master Charge and VISA OK. Please add \$3.00 for shipping in the U.S.A. \$5,00 for Canada or Mexico Proper postage outside of U.S.: Canada - Mexico

Dealers: We are distributors for all items in this ad. Write for our catalog and price list CU 118



EDUCATION

16K **ECB**



This Quiz Could Be Solution To Early **Math Problems**

By Bruce K. Bell, O.D.

 $3 \times 3 = \square$

eeing my six-year-old daughter's performance drop in first grade math brought to mind nightmarish thoughts J of grueling over flash cards and parent imposed homework. But then as I searched for a solution, I recalled how her petite face would light up when I would allow her to interrupt me typing in line 6099 of Space Ghouls just to type in her name and see it on the TV screen. Why not a computer based math drill program?! And so ... Color Math Quiz 1.0!

Color Math Quiz is designed to be full of color (the eye's delight) and simple enough to be operated by pre-school children; yet includes levels to challenge junior high students. Although designed for run in Extended Color BASIC, it can be easily modified for Color BASIC. The program uses less than 2K memory, so will easily run on a 4K computer.

1st Screen: Here the upper limits of the operands are requested. For young children, this is entered by the supervising adult. If zero (0) is entered for either or both of the operands, then decimals less than one (1) are used. This screen is viewed only after RUN.

2nd Screen: This is the operations menu. Five menu items are presented; addition, subtraction, multiplication, division and fractions, respectively. To the left of the first item appears a reversed question mark (?). If addition is desired, then the Y key is pressed. Otherwise, the N key is pressed. The program uses INKEYS so ENTER is not necessary. Additionally, the program is key specific and will accept no other responses. After the response, the question mark is displayed to the left of the second menu item. As many, or as few of the operations may be chosen as desired by simply pressing Y or N by the appropriate item. After entering the fifth menu choice, the third screen appears automatically. 3rd Screen: At the top of the screen, the operation choices are displayed. Below this, the first problem is given. If the

(Bruce K. Bell, a practicing optometrist, has developed a computer program for analysis of optometric data and uses it in his practice. He has written and lectured on vision and it's role in learning disabilities.)

answer given is correct, then a colorful banner is displayed. Otherwise, the correct answer is given. After six problems "charge" is played and the number correct is shown at the top of the screen. After a few seconds, the menu is redisplayed.

END: To end the program merely press that little red key the BREAK key.

Fractions: If fractions are chosen, then the operands will be fractions less than one (not decimals unless the upper limit is zero) with the upper limits of each numerator and denominator as set in the first screen. If fractions are not chosen, then integers are used as previously discussed.

To input an answer to a fraction problem, type the numerator followed by a comma (,) and the denominator, then ENTER it.

COLOR BASIC MODIFICATIONS: For using in Color BASIC, simply omit lines 3, 8, 115 and 305. Change the phrase "FNR(X)" in lines 255 and 400 to INT(X+.005) *100)/ 100 where X is the appropriate variable. For example the first command in line 255 would be changed to R+INT ((R+,005)*100)/100.

INTERNAL FUNCTION

Lines 1—8 Define variables Lines 10-60 Input operand limits Lines 100—140 Input from Menu Lines 150-310 Quiz is performed Lines 400-430 **Build fractions** Lines 1000-3000 Mathematical operations performed Lines 9000-9030 Subroutine for color banners 9050 **INKEY\$** subroutine Line

Color Math Quiz incorporates several programming functions to make it user friendly. Line 120 uses POKEs to the video memory located from 1024 to 1536, each corresponding to a PRINT@ location (0-511). The POKE method is useful to obtain characters not available by CHR\$ or when a cursor no-update is desired. To see the full array of characters available by this method the following program may be used:

10 CLS





\$24.95

Management System

user-oriented, easy to use personal database management system for the TRS-80° Colo A user-oriented, easy to use personal datable Computer with these outstanding features:

- * keeps files of programs, names, addresses, birthdays, recipes, class or club rosters, etc.
- * variable record and field lengths
- phrase substitution editor
- ± up to 8 user-definable fields
- ML sort (up to 3 fields), search and delete functions
 user-definable printer format, for any printer
- * up to 230 characters per record

Price includes the database management system, full documentation including a referen guide and 1981 Bibliography of Color Computer articles

Requires 16K Extended Basic, 32K recommended.

1982 TIMS Bibliography - \$9.95.



\$19.95

The TIMSMAIL mailing list manager has most of the fine features of TIMS as well as these special mailing label features:

- * user selected label formats
- continuous or single sheet
- * designed for 80 column printer
- * 1, 2 or 3 labels wide
- * 2.5, 2.75, 3, 3.5 and 4 inch labels
- select records to print
- * fast ML search, sort (up to 3 fields) and delete routines

Requires 32K Extended Basic



\$19.95

Auto Bun is a utility program for the TBS-80° Extended Basic Color Computer. It is used to add convenience and professionalism to your software.

Auto Run will help you create your title screen with the graphics editor. The graphics editor allows you to choose a background color and border style. Using the arrow keys and several

other commands you can draw pictures, block letters and also include text.

Auto Run will generate a machine language loader program to preceed your program on the tape. Then, to start up your program, simply type CLOADM to load in the Auto Run loader program, which will then automatically start itself up, display your title screen, load your program and then RUN or EXEC it.

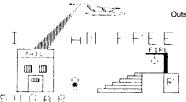
Also you may record a vocal or musical introduction preceeding your program. The Auto Run loader will control the audio on/off.

Basic programs can be set to load anywhere in memory above the PCLEAR 0 page Software authors: The Auto Run prefix may be appended to your software products Price includes complete documentation and assembly source listing Requires 16K Extended Basic

Galactic Hangman

\$17.95

A great new twist to the popular educational word quessing game for the Color Computer. Large (700 words) and sophisticated vocabulary. Or enter your own words, your child's spelling list, foreign language vocabulary, etc.



Outstanding high resolution graphics, animation and sound effects. Price includes both 16K and 32K versions

> SUGAR SOFTWARE 2153 Leah Lane Reynoldsburg, Ohio 43068 (614) 851-0565

CIS orders EMAIL to 70405, 1374

PIRATECTOR!

\$99.95

Our disk-based antipiracy applications development system has these features:

- Protect your disk software from piracy
- Users can create (non-excutable) backups
- Protects ML or Basic programs
- Your program is encrypted, which prevents listing or disassembly
 Loader displays graphic title screen, then loads and starts your program
- Incrementing serial numbers and other user data supported
 Automatic generation of copies from your master for 2 (or more) disk drives

 Disk initialization
- Copy all files from master to target
- Piratect up to 5 programs on target disk
 100% Machine Language
 Easy to use full-screen menu oriented

- User subroutines
- User subroutines may be LOADMed
- Usable by ML or Basic
- Border drawing routine
 Keyboard input routine ideal for your programs
- Position independent
 Break key disable for Basic programs
- * Title screen graphics editor to create your own title screen High resolution
- Semigraphic modes 8, 12 and 24 (64x64, 64x96 and 64x128)
- 8 colors
- · Combine text with graphics
- Load, display, save graphic title screens made with other graphics editors
- * Protect demo disks you send out



\$19.95

Disk Version - \$24.95 Disk version with all 62 stories - \$49.95

A sensational and educational version of a popular party game for the TRS-80° Color Computer... For 1 to 10 players. Load a story into the computer. The players are asked to supply a noun, verb, part of body, celebrity, etc. which the program uses to complete the story. The story, which is displayed when all words are entered, will be hilarious.

Price includes Silly Syntax game, user guide and 2

Requires I6K Extended Basic (32K for disk)

You can create your own stories or order story tapes from the selection below.

Each story tape is \$9.95.

 Silly Syntax stories - Ten stories per tape.

 SS-001 - Fairy Tales
 SS-004 - Current

 SS-003 - X-Rated
 SS-006 - Adventur

 SS-007 - Potpour
 SS-007 - Potpour

SS-004 - Current Events SS-006 - Adventure Sci-Fi SS-007 - Potpourn

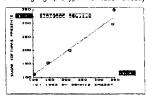
PREREADER \$19.95

Help your preschool age (3-5) child learn to read with this easy to use menu-driven program Great high resolution graphics, colors and sound effects. Includes capital and small letters, numbers, shapes and colors, much more! Requires 32K Extended Basic and joysticks.



STATGRAF is a linear regression analysis package combined with sophisticated high resolution plotting/line graphing. Features include: allows entry of up to 250 pairs of (x,y) data, transforms observations using logarithmic, square root, inverse exponential or additive codes, plots any number of data sets on a single graph, type information directly onto the graph in 3 orientations

Requires 32K Extended Basic







Add \$1.00 per tape or disk for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. Dealer inquiries invited.

20 FOR X=0 TO 255: POKE 1024 +X,X: NEXT 30 GO TO 30

By making menu selections in this manner, any combination of operations can be chosen.

The DEFFN and FN commands are useful when a single variable mathematical operation occurs several times during the program. Each time X=FNR(X) is encountered, X (or whatever the current variable) is rounded to two decimal places by the formula given in line 3.

The operands and operators are randomly selected in line 200. If fractions are to be performed, then the random selection of numerators and denominators occurs in line 400.

Line 2000 tests to see if the difference is less than zero, while line 4000 tests to see if the quotient is a decimal number. If neither is true, then randomizing reoccurs. The exception is during fractions where negative numbers are allowed.

The color banners are created in lines 9000 and 9010. The Boolean operation AND is performed on X to keep its value between ZERO (0) and seven (7). AND compares bit by bit the value of X and 7. If both are set (equal to one) then the resultant is set. For example, (5AND7)=5 because

0101 = binary 5AND 0111 = binary 7

0101 = binary 5

On the other hand (8AND7)=0 because

AND 0111 = binary 7 0000 = binary 0

"AN ABSOLUTE JEWEL", "THE PERFECT DBM"
"I USE C.C.WRITER FOR MY CORRESPONDENCE"
"IMPRESSIVE", "JUST RIGHT", "PROFESSIONAL"

Trans Tek Software

has earned these words of praise from reviewers in The Rainbow, 80 Micro, Creative Computing, and other publications. Like our customers, you'll see why when you buy:

C.C.Calc The Electronic Spreadsheet \$34.95

C.C.File The Micro Data Base Manager \$12.95

C.C.Writer Versatile Word Processing \$29.95

C.C.Mailer Mailing List/Letter Merge \$29.95

from

Trans Tek
i94 Lockwood
Bloomingdale, IL 60108
or
your Favorite Dealer

To see the values C, in line 9000, takes on, type the following program.

10 CLS

20 FOR X=1 TO 32: C=(XAND7)

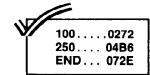
30 PRINT X": "C, : NEXT

40 GO TO 40

Variables H1\$, H2\$, H3\$ Title/Credits 0(X), 0(X)Arithmetic operators Work variables X,K,Q\$,S,T,O CH\$ Charge chorus **M**\$ Menu heading A.B.AR.BR Operands Fraction operands AN,BN,AD,BD R,RN,RD,C Responses, correct answer NC Number correct

Possible Modifications

As written, Color Math Quiz reinitializes the number correct each time the menu is encountered. For cumulative scores, delete the statement NC=0 in line 100. Also you may desire to establish lower limits as well as upper limits. Merely add the desired lower limit to the resultant of the random operand selection in line 200. By removing the randomizing function of BR in line 200 and letting B=BR you can now do, for example, multiplication tables for the sixes (6s).



The listing:

Ø 'COLOR MATH QUIZ MAY BE FREELY COPIED AND MODIFIED FOR PERSONA L USE

1 H1\$="COLOR MATH QUIZ 1.0": H2\$ ="COPYRIGHT (C) 1983 BRUCE BELL"

: H3\$="EXTENDED COLOR BASIC 16K"

2 DIM 0(5),0\$(5)

3 DEF FNR(X)=INT((X+.005)*100)/1

5 H1\$="COLOR MATH QUIZ 1.0": H2\$
="COPYRIGHT (C) 1983 BRUCE BELL"

: H3\$="EXTENDED COLOR BASIC 16K"

7 O\$(1)="+": O\$(2)="-": O\$(3)="X

": O\$(4)="/": O\$(5)=","

8 CH\$="T7;03;L5;G;B;04;C;D;P10;0 3;B;04;L2;D"

10 CLS: PRINT H1*,H2*,H3*: PRINT 50 PRINT: PRINT"ENTER THE UPPER INTEGER LIMITS FOR THE OPERANDS

60 PRINT: INPUT"FIRST LIMIT"; AR: INPUT"SECOND LIMIT"; BR

100 NC=0: CLS: PRINT H1\$,H2\$,H3\$,,,: K=0: M\$=" OPERATION MENU ": GOSUB9000: PRINT

110 PRINTTAB(7)"1. ADDITION (+)"
TAB(39)"2. SUBTRACTION (-)" TAB
(39)"3. MULTIPLICATION (X)" TAB(
39)"4. DIVISION (/)" TAB(39)"5.
FRACTIONS (,)": PRINT

115 SCREENØ.1 120 FOR X=1T05: POKE1253+X*32,63 130 GOSUB9050: IF Q\$="Y" THEN O(X)=1: POKE1253+X*32,25 ELSE IF Q \$="N" THEN O(X)=0: POKE1253+X*32 ,14 ELSE13Ø 14Ø NEXTX 15Ø M\$="": FOR X=1TO5: IF O(X)=Ø THEN NEXTX ELSE M\$=M\$+O\$(X)+" " 160 S=(16-LEN(M\$))/2: M\$=STRING\$ (S, " ") +M\$+STRING\$(S, " ") 170 K=0: CLS: PRINTTAB(7) "COLOR MATH QUIZ 1.0": GOSUB9010: PRINT 19Ø FOR T=1TO6 200 A=RND(AR): B=RND(BR): O=RND(4): IF Q(0)=Ø THEN2ØØ 205 A=FNR(A): B=FNR(B) 21Ø IF 0(5)=1 THEN4ØØ 220 ON O GOTO1000,2000,3000,4000 240 IF 0(5)=1 THEN255 250 PRINT A; 0\$(0); B"=";: INPUTR 255 R=FNR(R): C=FNR(C) 26Ø IF R<>C THEN PRINT "NO, "C"IS CORRECT" ELSE PRINT"RIGHT!";: F ORX=ØT025: PRINT CHR\$(143+16*(X AND 7)):: NEXTX: NC=NC+1 27Ø NEXTT

300 PRINT@7,"YOU GOT"NC"CORRECT! 3Ø5 SCREENØ,1: PLAY CH\$ 31Ø FOR X=1T05*49Ø: NEXTX: GOT01 ØØ 400 AD=RND(AR): BD=RND(BR): AD=F NR(AD): BD=FNR(BD) 410 PRINT A"/"AD; 0\$(0); B"/"BD"=" 420 INPUT RN, RD: IF RD=0 THEN420 425 R=RN/RD: A=A/AD: B=B/BD 43Ø ON O GOTO1ØØØ,2Ø1Ø,3ØØØ,4Ø1Ø 1000 C=A+B: GOTO240 2000 IF A-B<0 THEN200 2010 C=A-B: GOTO240 3000 C=A*B: GOTO240 4000 IF A/B<>INT(A/B) THEN200 4010 C=A/B: GOTO240 9000 FORX=1T032: C=(X AND7): PRI NT CHR\$(143+16*C);: NEXT: PRINT 9010 FOR X=1TO8: C=(X AND7): PRI NT CHR\$(143+16*C);: NEXT: ON K G OT09Ø3Ø 9020 PRINT M\$;: K=1: GOTO9010 9030 RETURN 9050 Q\$=INKEY\$: Q=VAL(Q\$): IF Q\$ ="" THEN 9050 ELSE RETURN





SOUTHERN SOFTWARE SYSTEMS

SERIOUS SOFTWARE FOR THE COLOR COMPUTER Presenting. . .THE GRAPH ZAPPER. THE BAR ZAPPER and THE PIE ZAPPER

- THE PIE ZAPPER draws pie charts of your data-plain or fancy sectors-5 kinds of sectors-alternate sectors styles to make an outstanding impact-labeled sectors - option to display raw numbers or percentages on chart with or without totals.
- THE BAR ZAPPER creates bar graphs with multiple bars five different bar styles positive and negative bars can use names or numbers for bar identification - plenty of options - "Extremely easy to use. . . Beautiful. . . . Well prepared and documented tool." The Rainbow, April 1983.
- THE GRAPH ZAPPER plots line graphs of data and equations-multiple lines with different symbols-mix equations and data on the same graph-with or without grids - plots lines or points - "The Graph Zapper is one of the most completely documented pieces of software we have seen. . . The Graph Zapper is an outstanding utility and can be a major tool in statistical, business and other uses where graphic representation of numbers is desirable." The Rainbow, Dec. 1982
- Endless applications electric consumption, stock prices, math class equations, children's height and weight, data analysis, trend indication, experimental results, statistical analysis, sales presentations.
- The three ZAPPERS provide you with a sophisticated capability that will handle from the simplest to the most complex graphing needs.

All three ZAPPERS have these Features:

- High resolution graphs with on screen numbers, titles, and labels.
- · Sophisticated data editor makes changing data simple.
- · Disk version has added features including storing completed graphs on disk and menu driven file loading.
- · Detailed user's guides for all features.
- · Low resolution graphs can't compare.
- · 14 day money back guarantee. \$15.95

for 16K tape versions

- · User friendly, easy to understand.
- · Thorough error prevention.
- · Save data for later graphing or editing.
- · Low cost upgrade from tape to disk.
- Hard copies possible with readily available screen print programs for nearly any brand of printer.
- · Requires Ext. Color Basic and delivered on cassette.

or VISA/MasterCard number and expiration date \$44.95 for all three tape versions + \$3.00 shipping

\$19.95 for 32K disk versions



\$56.95 for all three disk versions + \$3.00 shipping

add \$1.00 for shipping . . . send check, money order,

Florida residents add 5% sales tax

SOUTHERN SOFTWARE SYSTEMS

485 South Tropical Trail, Suite 109 • Merritt Island, Florida 32952 •

(305) 452-2217



Eeeeeee Yah! Ninja Warrior Is Here

I've always had a secret desire to be a martial arts expert. I even took a couple of Judo lessons once, but never found the time or the energy to finish them. I guess I'm really a lover, not a fighter.

But now! I'm a Ninja Warrior. A Ninja warrior is a deadly kicking, high jumping, Sai (pronounced "sigh" and looks like a trident, a three-pronged spear) carrying martial arts expert, who destroys boulders with a kick, catches fiery meteors on the Sai, jumps over deep chasms, and fights enemy Ninja.

As you've probably guessed, Ninja Warrior is a new arcade-style game for the CoCo and the TDP-100. Charles Forsythe, a 17-year-old M.I.T. student is the author of this machine language program from the Programmer's Guild. It is designed to run on any 16K machine and comes on a protected cassette (auto-load and EXECute) in a handsomely decorated box and with one sheet of instructions. The game responds to either keyboard control or the left joystick. The scenario of the game is as follows: You're a Ninja Warrior running "along a dangerous mountain road" (though the mountain road is perfectly flat). You encounter obstacles along the way which must be dealt with. Boulders are everywhere and can be kicked to dust or jumped over. At higher levels, fire appears in the road, too, but can be

jumped. At even higher levels, pits open at your feet and you have to jump for your life. Also in the higher levels, fiery meteors appear falling from the sky and, if you're agile enough, you can catch them on your Sai.

As you progress, things get more complicated as enemy Ninja appear and have to be destroyed, boulders begin appearing stacked two high, and in the upper levels, the boulders start shooting arrows. At the highest level, when you become a grandmaster, you get to confront the Ultimate Ninja! (No, I haven't had the pleasure yet, but I can't wait.)

Actually there are 16 levels or belts (like brown belt, black belt, etc.) of play, each getting more difficult as more and more of the obstacles begin to appear. Each level seems to add a new type of obstacle, not all of which are documented.

You initially have three Ninja Warriors and get an extra one for each 10,000 points. I don't know how many you can have at one time, as I've not been able to keep more than three and the instructions don't even mention extra warriors. The game can have one to six players and the top three scores are displayed on the rather colorful title screen (generated by the auto-loader).

The Ninja is controlled by either the keyboard or left joystick (the instructions failed to mention it was the left one). The keyboard control uses the spacebar to kick, the up-arrow key to jump and the right-arrow key to "speed up" the Ninja. The joystick uses the fire button to kick. The jump is achieved by pushing the joystick forward and, for "speed up," you push the joystick to the right. I recommend the use of a center return-type joystick because if the stick isn't returned to center after a jump or speed up, you can't kick. I don't have a center return-type and found it very difficult to keep it centered myself, so I used the keyboard control and found it to be very good.

The graphics are well done, if not overwhelming, and the sound is good, though the running sound starts to grate a bit after a while. The illusion of motion is produced by having the Ninja "running" in place at the left side of the screen and the obstacles and the sky move from right to left; the effect is pretty good. The speed-up is just moving the Ninja toward the right edge of the screen, giving you less time to decide what to do for each newly appearing obstacle. This speed-up option adds a third dimension of control which really strains the old hand-eye coordination. After playing this game for a couple of hours now, I still haven't mastered it (but coordination was never a strong point for me).

My two resident arcade players, Cheryl, age 12, and Tim, age nine, initially were not impressed with the game, probably because of the high level of coordination necessary to play. I told them to stick with it for a while and, now, I need a reservation to get at my CoCo.

On a slightly sour note, I found the instructions to be confusing, misleading and not very complete. Fortunately, the game itself is simple enough not to require a lot of information to play. My adventurous son, who never reads the instructions anyway, tried all sorts of things, some of which worked in spite of the instructions telling me otherwise or not mentioning them at all.

So, if you like to be challenged, give yourself a treat and become a Ninja Warrior.

(The Programmer's Guild, P.O. Box 66, Peterborough, NH 03458, \$29.95 on cassette)

-C.L. Pilipauskas

THIS PAGE FOR A SUPER SUMMER SPECIAL

EXO

FHL CC-FLEX has become the standard FLEX for the CoCo. Now you can buy CC-FLEX for only \$69.95 for a savings of \$30. CC-FLEX includes more extras, more utilities, and more functions than any other.

INCLUDES:

- * BEST PRICE IN THE WORLD!
- At \$69.95, CC-FLEX, with all these features, is the best price anywhere!

 * OFFICIALLY LICENSED TO FHL FROM TSC
- an official licensed FLEX from TSC. Be wary of unlicensed implementations.
- * NEW SMOOTH SCROLLING

New with version 5.0:4 is SMOOTH scrolling. This is a feature not found on any other FLEX

* NEW VARIABLE RATE SCROLLING

Variable rate scrolling lets you control the speed that the screen scrolls, from smooth to very fast scroll. Also this version of CC-FLEX is 50% faster in scrolling than

. NEW 'TED' TINY EDITOR

Included with CC-FLEX at \$69.95 is 'TED', which stands for Tiny Editor. TED is fine for small editing jobs and is the easiest editor to use of any available. You can learn how to use it in less than five minutes!

NEW 'ISM' INTERACTIVE ASSEMBLER

ISM is the program for those interested in assembly language but not convinced that they need to buy one. ISM is the perfect teaching tool to use to learn assembly language programming. You will need to use it in conjunction with a book on the subject (not provided). However, ISM includes a complete manual on its operation.

* NEW EXTERNAL TERMINAL PROGRAM

If you want to run CC-FLEX connected to a terminal so that you can get the benefit of a real keyboard and full 24 x 80 display, then EXT will do it for you. EXT allows a standard terminal and printer to be connected to the CoCo. 'NEW' EXT now supports real hardware handshaking.

* EASY START UP

Just type RUN"FLEX" or DOS if you have 1.1 Disk ROM. Quote from the June 1983 issue Hot CoCo. Re: FLEX by David Wasler, pg. 143, "It is the easiest to use. After you receive it, just put it in your drive and type RUN"FLEX"."

* ONLINE "HELP" CAPABILITY

Just like the big mainframes, CC-FLEX has a help function. Just type 'HELP' and CC-FLEX will answer your questions and help you run FLEX without having to keep paging through the manual

RECONFIGURABLE TO YOUR NEEDS

CC—FLEX'S powerful SETUP facility lets you change CC-FLEX to suit your needs and hardware. CC-FLEX is the only FLEX that gives you such complete control.

* SUPPORTS ALL DRIVE TYPES AND SIZES, EVEN 3"
CC-FLEX supports every type of drive currently available for the CoCo. These include 35,

40 and 80 track single and double sided. Even the new 3 inch from AMDEX. We supply support software on the 3 inch drive.

* SIX DIFFERENT HI-RES SCREENS

51 x 24 and 16 x 32 with true lower case, 64 x 24 and 64 x 32 all upper case. You can switch between these screens at will. The different scroll types are available for each

* SUPPORTED BY THE LARGEST 6809 SOFTWARE FIRM IN THE WORLD! FHL is the largest software house in the world for 6809 based computers! We have over 100 software packages for FLEX and OS-9. We support CC-FLEX like no other.

OPTIONS AVAILABLE AT EXTRA COST:

- * DBASIC Radio Shack Disk Basic adapted to work with FLEX
- This is standard RS Disk Basic working with FLEX. This only works with FHL FLEX at this time. DBASIC has everything that RS Disk Basic has except for Direct access files and those functions that go with Direct access files.
- ED/ASM Full feature Editor and Assembler

SPECIAL now only \$69.95! ED/ASM is the best Editor and assembler for the Color Computer. The editor is both screen and line oriented while the assembler is a full conditional macro assembler.

REVIEWS:

Quote from the June 1983 issue of HOT COCO. Re: FLEX by David Wasler, pg. 143. Frank Hogg Color FLEX has been on the market the longest and has the most software support. It is also the easiest to use. After you receive it, just put it in your drive and type RUN"FLEX".

Quote from the March 1983 80 MICRO review by Scott Norman, pg. 101.

"I think CC-FLEX offers the most painless way of trying one's hand at an advanced operating system for the Color Computer. It offers quite a few "big machine" features, and opens the door for a lot of applications software.

Frank Hogg Lab brought FLEX to the CoCo over a year and a half ago. It has gone thru 5 updates since its original release in February 1982! FHL not only has FLEX, we support our FLEX with more software than anyone else in the world! We have over 100 software packages compatible with FHL CC-FLEX to fulfill all your needs. These range from languages, utilities and software development tools to data base management, word processing and business applications. We guarantee these programs will work with our FHL CC-FLEX and probably with any licensed version of FLEX!

And, there is no better way to purchase FLEX for less!!

order FHL CC-FLEX today and take advantage of our SUMMER SPECIAL of \$69.95 to bring out the true power of your CoCo!!

We will accept Prepaid, COD, VISA, M/C and Diners, Please include \$3.50 for shipping and handling



BEST JUST GOT BETTER

ED/ASM .\$69⁹⁵

LOOK AT THESE FEATURES

ED

ED is both line and screen oriented. This means that you can edit by line number or by using screen type editing where you move the cursor to where you wish to edit and then your changes. The line editing mode is very handy for programming as most assemblers and compilers refer to line numbers when an error occurs, thus making it easy to correct if the editor like ED can go to a line number to edit. Once there, ED can switch to screen editing to make the corrections.

ED also has cut and paste type of editing, where you can split a line and move the other half. You can also delete and rename files on disk from ED, edit more than one file without leaving ED, and many more. Here is a list of features:

Menu will list the command set for ED

Set allows changing editor characters

Cursor allows changing cursor control strings **X** sends out a user defined string

Status list flags and other internal editor settings

Head allows setting and listing of headers and tabs

Tab allows setting tab stops

Width set screen width

Number toggle number flag

Renumber renumbers the lines Verify toggle the verify flag

Zone set or reset the zone flag for string searches

Top go to the top of the text (also works)

Bottom go to the bottom of the text (! also works)

Next target line becomes the current line

Find finds target string

Append appends a string to the current line

Change changes this to that in the text CChange like above but asks you first

Copy copy a block a text
Cut cut the current line at a specified column

Delete a line or block of lines

Expand tabs in the text **Insert** insert after the current line

Move move a block of text

Overlay the line

Print a line or block of lines

Replace a line or lines Splice a line to the current line

Stop save the text to disk and edit

Abort exit the editor without changing anything

New allows working with files larger than available memory

Edit restart the editor with a new file

Dir list the directory of the disk

Read insert a file from disk into the file in memory

Write write a block of lines to a file on disk Save save the file to disk

List list a line or group of lines

FEDL deletes a tile on disk FREN renames a file on disk

CMACRO create a macro

LMACRO list one or all macros

DMACRO delete a macro

MACRO execute a macro

CALCULATE performs math functions with results in binary, decimal, and hex EXEC exec a text file as a set of commands for the editor

Bell rings the terminal bell (useful in macros)

REM used to document macros.

As you can see, ED is a very versatile and powerful editor for all your editing needs. It is particularly useful for the programmer that needs a flexible editor!!

THE BEST JUST GOT BETTER ** SUMMER SPECIAL ED/ASM ONLY \$69.95

FHL ED/ASM has been recognized as the most versatile package in its price range for FLEX. Now the best is less. Save \$30 by buying ED/ASM during our summer special!!

LOOK AT THESE FEATURES ASM

ASM is a fast and versatile (8 bit) macro assembler. It has the necessary elements to support structured constructs like WHILE and FOR etc. These are the ability to define macros with substitutable parameters, conditional assembly directives, and the ability to change the value of a label or symbol. In addition, source code may be assembled in modular form. That is as a series of LIBrary files. A short file containing a list of file specifications in standard assembler source format may call as many library files as desired. Symbols default to a maximum length of 6, but may be redefined to a maximum length of 3 to 30 characters

ASM supports auto fielding and automatic label generation. Labels may be automatically generated and accessed within expressions.

This function has great power when used within macros. An example is the BASIC statement PRINT "HI". A macro would be created as:

An example would be:	PRINT MACRO	would expand into:
BRA :1	LDX #:1	PRINT "HI"
FCC "HI",4	JSR PSTRNG	LDX L0001
: EQU *	BRA :2	JSR PSTRNG
becomes:	: FCC "&1",4	BRA L0002
BRA L0001	: EQU *	L0001 FCC "HI",4
FCC "HI",4 L0001 EQU *	ENDM	L0002 EQU

ASM supports the following directives or pseudo operators.

FCC	form constant	MACRO	define a macro
	character(s)	ENDM	end a macro definition
FCS	form constant string	EXITM	exit macro being called
FCB	form constant byte	DUP	duplicate lines n times
FDB	form double byte		up to 'ENDD'
SPC	insert spaces in the	ENDD	end duplication bracket
	output listing	IF	conditional assembly
LEN	set up length of output		control
	line for printing	ELSE	complement true-false
OPT	switch assembler		flag
	options	ENDIF	end conditional
PAG	skip to next page		assembly clause
ORG	detine a new origin (*)	ENDC	end conditional
RAM	define a new storage		assembly clause
	counter origin (.)	WHILE	incremental conditional
EQU, SET	(re-) assign a value to		assembly control
	a symbol	WELSE	complement sense of
END, MON	signal end of source		WHILE test
	code	ENDW	end WHILE clauses
NAM, TTL	specify a name or title	LIB	open a library source
STTL	specify a subtitle		code file
RMB	reserve memory bytes	SYM	define length of
ERR	print error message		significant characters
RPT	repeat following line		for symbols
	n times		

So, order FHL ED/ASM today and take advantage of our SUMMER SPECIAL to bring out

the true power of your CoCo.

We will accept Prepaid, COD, VISA, M/C and Diners. Please include \$3.50 for shipping and handling



Logo, Pilot And Computer Literacy

By Larry Kheriaty

Probably the most common justification for buying a Color Computer is education, whether it be at home or in the classroom. Most of the people I know who have bought a personal computer say that at least one of their reasons is to allow themselves or their family members to learn a little about how computers work. In my town there are some excellent computer literacy courses based on the Color Computer being taught at schools ranging from Assumption Grade School to Western Washington University. I am also aware of several businesses or schools offering

"For older persons there is often the problem of an already acquired mistrust of computers or a feeling that they are too mathematical or too complicated to understand. The best way to solve this is, again, hands-on experience with a computer."

very poor instruction in computer literacy. What distinguishes a good course from a bad one? To answer that question we need to talk first about what we mean by computer literacy.

The goals of any computer literacy program are the same whether you are enrolled in a formal course taught by an instructor, or you are learning at home on your own. There are essentially three goals. First, and most important is to raise the student's comfort level with the computer. This is accomplished by hands-on experience designed to simply let the student see firsthand that nothing will explode if the wrong button is pushed. The younger the person, the easier it is to develop a relaxed familiarity with the computer, and there are fewer misconceptions, fears or anxieties about the computer. Television and video games have paved the way for this aspect. For older persons there is often the problem of an already acquired mistrust of computers or a feeling

(Larry Kheriaty is owner of Washington Computer Services in Bellingham, WA and is author of Radio Shack's Pilot, Logo, Game Writer and several other Radio Shack company products.) that they are too mathematical or too complicated to understand. The best way to solve this is, again, hands-on experience with a computer. If they start out on the right foot, people are usually pleasantly surprised at what they can do without much technical knowledge.

The second goal is to build realistic expectations about what a computer can do. This requires that you know, at least in general terms, how a computer does what it does. As an analogy, we are all literate enough about automobiles to avoid such mistakes as to expect one to fly, or to attempt to use a sports car when a dumptruck is called for. It isn't necessary to be a mechanic in order to use a car effectively, but most drivers understand the car well enough to know the difference between a flat tire and running out of gas. These examples are so obvious that they sound absurd. But time and time again, I have spoken to people who have bought a computer expecting it to do a job that it simply could never do. The choices they make are so far from realistic that it is clear they did not have enough basic understanding to do anything other than buy what the salesperson said would be good for them. Other common misconceptions are expecting the computer to be intelligent, or expecting information back out of the computer that is not first put into the computer. An example of this is the storekeeper who would like to be able to check with the computer to see the present state of his inventory at any time; while not realizing the amount of work necessary to keep that information up to date on the computer, and not realizing the amount of data storage consumed by such a system. To become literate about cars we ride in them, drive them, buy a car and cope with the problems that come up as we use it. To become computer literate you should run one, try various programs and cope with the problems that come up. In this way you see firsthand what the various parts of the computer do and how things are done on the computer.

The third concept of computer literacy is to understand what software is, and what its relationship to the computer is. In fact, what is learned here is that computer literacy is actually software literacy. The computer itself is inert without a program to direct it and tell it how to respond to the user. Traits that might be thought of as the computer's are really the program's. And the personality or "soul" of the computer can be changed at any time by running a different program. A good way to think of it is that the computer is only a delivery medium. When a program is run, there are two parties in the conversation; the person and the program.

When you talk to someone on a phone, you do not converse with the telephone itelf, it is only the medium by which you communicate with the other person. When you can think of running a program on a computer as similar to talking with a person on a phone, you are on the right track. Along with this view of software, it is necessary to understand how software tells the computer what to do. Just as it is not important to become a mechanic in order to drive a car, it is not important to become a programmer to run a computer. But it is necessary to be exposed to programming enough to see how things are done. In the sense that a computer thinks by running a program, you can use a computer best if you know how it thinks.

The concept of software is the one that makes the computer so different from any other tool. It is also the concept which most often confuses the new user. To add to the confusion people are told that BASIC is about as easy as it gets. Then, when they find that it is a very slow and complicated process to write a BASIC program they can get discouraged. Since software is the most unfamiliar idea to the new user, it is the one that should be approached most carefully. Since it is not a goal of computer literacy to make programmers out of everyone, it is more important that the first contact with programming be truly easy, and be truly representative of what software is about. So when it comes down to it, the most important aspect of any computer literacy program is the selection of the software to be used for the person's first experience.

This is where Logo comes in. Logo is specifically designed to introduce people to programming. The results of a program are always a picture on the screen. This gives the student immediate visual feedback on what has happened. To the student, Logo appears as a "turtle" which lives on the display screen. At any time, the turtle is visible at a specific place on the screen, and is pointed in some direction. The user tells the turtle to walk forward so many steps, or turn right or left so many degrees. As the turtle moves, it leaves a colored line on the screen. The effect of seeing an immediate action take place on command gives the student a good feel for the concept of telling the computer exactly what to do. For example, the student would type a command like FORWARD 50 and the turtle would immediately move 50 steps in the direction it is pointing. For children too young to read, or type, Logo is supplied with a keyboard overlay which labels some of the keys with pictures that represent turtle commands. Using the "doodle mode" the turtle can be directed by single keystrokes. Once the student is comfortable with giving one command at a time, she can combine several commands into a procedure, give the procedure a name, then tell the turtle to do the procedure. For example: TO BOX

FORWARD 50 or TO BOX
RIGHT 90 REPEAT 4
FORWARD 50 (FD 50)
RIGHT 90 RT 90)
FORWARD 50
RIGHT 90
FORWARD 50
RIGHT 90
END

The BOX procedure on the left tells the turtle how to draw a square on the screen. The BOX procedure on the right does the same thing, but uses abbreviations for the words FORWARD (FD) and RIGHT (RT). It also saves typing by using the REPEAT command which just says to do what is

in the parentheses four times. A procedure always starts with the word TO followed by a name. It ends with the word END. Once the procedure BOX is typed into the computer's memory then the student can tell it "BOX," and the turtle will follow the procedure named BOX. The concept here is that by writing the procedure the student has told the turtle how "to box" when it is told to do so. If the student were to tell the turtle "FLY," then a message "I DON'T KNOW HOW TO FLY" would come back. This would mean that no procedure has been entered to give the instructions to be followed when told to fly. The student can enter any number of procedures; each one defines a new action that the turtle knows how to do. By actually doing it the student learns what programming is about, and since LOGO procedures are so easy to understand, the chances for a good experience are much greater than with something like BASIC. One of the main benefits of LOGO is that the student learns structured, logical thinking by placing commands in logical order. Because of the visual nature of LOGO, there seems to be a high degree of incentive on the part of the student to experiment with ideas. In fact, the basic premise is that LOGO is a tool for experimentation and creativity. It is very easy to master the commands needed to use LOGO, but they can be combined in an infinite variety of interesting ways. The concept of modular or "building block" logic is fostered since the student can use previously defined procedures to build new procedures. For example: TO FAN

REPEAT 20 (BOX RIGHT 18) END



The Micro Catalog

DISCOUNT HARDWARE & SOFTWARE

"TAKE ADVANTAGE OF VOLUME BUYING"

- Some software houses offer up to 50% off for volume buying.
- We are dealers for over one hundred different software houses.
- We market over one thousand different programs.
- CONFIDENTIAL price list.
- NEWSLETTER
- SPECIAL BUYS





- 150 Page CATALOG
- Authors we pay 50%

Please send \$9.95 for CATALOG and CONFIDENTIAL PRICE LIST

P. O. Box 3703 Peoria, II. 61614

FAN produces a beautiful circular fan of 20 boxes rotated around at 18 degree intervals. Notice that it uses the previously defined procedure BOX.

To enter the procedures into memory, the student uses a very simple screen oriented text editor which is built into LOGO. The student just types on the keyboard and the screen shows what the text looks like. The various arrow keys are used to move about in the text on the screen. The editor is designed to be a simple example of how a typical word processor works. In fact, it can be used to enter any text, which could be printed on a printer later. So in the processing, probably the most common business use of microcomputers.

Even though LOGO was designed for kids, it turns out to be the best place to start for a person at any age since it starts out simple and lays an appropriate foundation for further learning. In this short article we have only scratched the surface of LOGO's capabilities. For the more advanced person, the concepts of recursion and multi-tasking can be explored since LOGO allows as many turtles as desired to all be running their own programs simultaneously. But beyond computer literacy, LOGO is a great medium for "playing" with logical concepts that expand the child's ability to think logically. And all experience so far shows that kids consider the challenge fun. I don't know where the word LOGO came from, but if it is derived from the Greek word "logos" it lives up to its name, which in different contexts means "word," "idea," "concept," "discovery" or "thought."

A second very useful educational program for the Color Computer is Color *PILOT*. It is used in quite a different

PRO-COLOR-FILE

"...PRO-COLOR-FILE is a very sophisticated data base management program..." (Color Computer News, June 1983)

"... It's definitely a gigantic step for the serious CoCo users..." (Rainbow Magazine, June 1983)

If you can't believe the reviews of these leading magazines for the Color Computer, then there is nothing we can say to convince you of the versatility of PRO-COLOR-FILE. **However...**

IF you're in need of a program with the flexibility that lets you design your own records management system with up to 60 data fields, 4 data entry screens, 14 math equations, 5 custom report formats, and records lengths of up to 1020 bytes; AND that has the capability to duplicate records, index a file alphabetically on up to 3 fields simultaneously, print reports on a printer or the screen, select records using <, < =, >, > =, =, < > comparators individually or together with AND / OR relationships, obtain totals and averages, find any record out of a file of 1000 in 10 seconds or less, and utilize from 1 to 4 disk drives, THEN PRO-COLOR-FILE WILL FILL YOUR NEEDS!

Only \$79.95 + \$2.00 Shipping and Handling.

We accept VISA, MASTERCARD, Checks or Money Orders.

Call or write for more details:

DERRINGER SOFTWARE, Post Office Box 5300, Florence, S.C. 29502. Phone: (803) 665-5676 after 6:00 p.m. (EDT). PRO-COLOR-FILE ©1983 Dennis Derringer.

*TRS-80 is a trademark of the Tandy Corp.

manner. With LOGO, the student learns by writing LOGO commands and programs. It is the experimentation with writing LOGO programs that provides the educational experience. PILOT, on the other hand, is used to write an educational program that will be run by the student. The writing of the PILOT program is like the preparation of a lesson. The student's learning experience comes from executing the lesson program. Also, with LOGO the subject matter to be learned is computer literacy and logical thinking, whereas PILOT is used in situations that have commonly been called "computer assisted instruction." As an example, a PILOT program could be written that would help the student study spelling. In this example, the author of the *PILOT* program would write the program so that the student is presented with problem words. The author is using *PILOT* to create some learning environment for the student. Students later run the lesson program and interact with it. In this case, the computer is a teaching medium for some other subject matter. The student is not necessarily learning about computers per se. PILOT has the same builtin text editor as LOGO, so the mechanics of entering a program are very simple. The PILOT language has commands that simplify the presentation of text and graphics. There are also simple commands to accept and judge student replies, then give appropriate feedback. In general, PILOT is much easier to learn for this type of programming than BASIC because PILOT is specifically designed for this application. The following *PILOT* statements present a question, accept a reply, then give appropriate feedback. It is, of course, too simple to be useful but it does show the essential elements of a question/answer frame.

T:What element is found in T:all organic compounds?
A: (accept an answer)
M:carbon (match for correct reply)
TY:That is correct. (correct reply feedback)
TN:No, the answer is carbon.

There are three contexts in which Color Computer PILOT would be useful. The first is in the preparation of educational software to be sold commercially. In this case the process is analogous to the writing of a textbook in that much work is spent on the original so that it can be published and used many times. The second environment for *PILOT* use is the classroom. The teacher uses *PILOT* to create a lesson, drill or lab exercise that complements the classroom material. This provides a way to give students extra practice where needed, supplementary material for advanced students or to demonstrate some point that can't be demonstrated by other means. The third context for *PILOT* is as a means of supplementing the student's school work at home. This could be done by the parent writing lessons, or by buying or checking out materials already written in PILOT. Even though PILOT would be easy enough for a child to learn, it would not normally be used as a language in which a child would learn to write programs. It is intended to be used to write programs that teach something, so to make effective use of PILOT one would have to know what is to be taught, and how to teach it. PILOT is simply the way to put the lesson into the computer so that it can be delivered later to the student.

LOGO and PILOT are both very useful educational programs that no Color Computer should be without. LOGO is used for computer literacy, and PILOT is used for computer assisted instruction.

Catacomb Is Amaze-ing Game

Oregon Color Computer Systems has come out with a new game, Catacomb. Just put in your cassette and CLOADM. The program does the rest. As a programmer, I wanted to see how the auto loader worked. When loaded into my EDTASM+, the source code didn't mean anything to me, and a couple of the commands even messed up the EDTASM+. Enough of this, let's get to the game.

You are trapped in a maze-like catacomb with the enemy patrolling all of the corridors. Although you have the energy to break out of the Catacomb when you start, it is recommended by this reviewer that you commandeer a full load of fuel to make it through the second screen. You must move through the Catacomb seeking fuel blocks until you feel you have enough. There are guards patrolling the Catacomb, so watch out! There are two types of guards, one type looking sort of like an "@" (at sign) and the other resembling swooping eagles. The "@" guards come through either the left or right wa"s and travel the horizontal passages. The eagle guards come in at either the top or the bottom of the screen and patrol the vertical passages.

When you turn on the computer, the color the game will be is already decided. It will either be a red maze with you blue or a blue maze with you red, the monsters are always white. If you are like me and are picky about what is what when it comes to color, this little routine in BASIC should clear up the problem. Just type it in when you power up. If the screen is red, then the maze will be red. If the screen is blue, the maze will be blue. Remember, type this in before loading the program.

- 10 POKE & HFF22, & HF8
- 20 POKE & HFFC5, & HF8
- 30 POKE & HFFC1. & HF8
- 40 FOR i=¢H400 TO &H1BFF
- 50 POKE I,&HAA
- 60 NEXT I

You should see a screen with many red, white, and blue blips on a black background. The screen should turn red from the top to the bottom (or blue). When the program finishes, type NEW:CLOADM. Catacomb should now load in. If the color isn't what you want it to be hit reset and then RUN the program again before you erase it. Because of the nature of the graphics screen you may have to reset the computer more than once. By the way, the BASIC program will work in Extended or Disk Extended BASIC. It might work in Color BASIC, but I don't know. Catacomb runs in all the BASICs.

Back to the program. To get to the second screen, you push the fire button. The second screen is the hyper-space corridor. You must maneuver around the enemy vessels which fly straight down, and avoid the space mines which fly straight down until they detect you, at which point they

crisscross the screen. You can fire now (goodie!) and your mission is to fly to the other end of the corridor, through the starport, and to the mother ship. A full load of fuel will guarantee that you have enough to reach the mother ship, but there are energy blocks along the way that you can try to pick up if you don't have a full load.

Pulling back on the joystick during flight will increase speed; pushing forward will slow it down. I can't describe the mother ship or the stargate, because I haven't made it there yet, but the screen gets rather full with perhaps 20 enemy vessels and 15 space mines crisscrossing in front of, behind and all around you.

On the first screen, you receive 25 points for each fuel block you steal, and 1,000 points for having a full load. On the second screen you get 35 points for each enemy vessel you destroy, 50 points for each space mine, and 1,000 points for reaching the mother ship.

This is a great program with very good graphics. If you like arcade games, purchase this one—it's good!

(Oregon Color Computer Systems, P.O. Box 11468, Eugene, OR 97440, \$19.95 disk or cassette)

-Scott Sehlhorst

OELRICH PUBLICATIONS, INC. BRINGS YOU MORE GREAT SOFTWARE VALUES

From DataSoft:

ZAXXON 32K Disk or cass. \$35.95 MOONSHUTTLE 16K cass. 31.00

From Synapse Software:

PROTECTOR II 32K Disk or cass. 29.95 PICNIC PARANOIA 32K Disk/16K cass. 29.95 SHAMUS 32K Disk/16K cass. 29.95

From Our own Software Lab:

3-D Tic-Tac-Toe 16K cass. 16.95 Frog-Trek 16K cass. 14.95

All prices include shipping!

SPECIAL OFFER! — ORDER ANY TWO GAMES AND GET A FREE M/L ADVENTURE GAME!!!

TO ORDER SEND CHECK OR M/O TO:

OELRICH PUBLICATIONS, INC. 4040 N. NASHVILLE CHICAGO IL 60634

OR CALL TOLL FREE: 800-621-0105 (in Illinois call 312-545-9286)

VISA AND MASTERCARD ACCEPTED

Pick Which: Original, But Lacks Playability

Many of the popular CoCo games today have their roots in the arcades. Others are adaptations of different types of pastimes, such as sporting and gambling games. Coming up with an original game that is also a fun one can be a very taxing chore.

Pick Which is a 16K machine language game that comes as close to original as any game that I have ever seen. It features good graphics and sounds, and can be played by up to four people at once.

Playing *Pick Which* is about as easy as you can get. After you select the desired number of players, you are ready to begin. A big picture appears on the screen, and there are 16 smaller, but not visible, pictures behind it (so to speak). By moving your joystick around, each of these smaller pictures can be made to appear one at a time. After a short period of time, the picture you are viewing at that moment begins to enlarge until it fills the screen. Depending on which picture you wind up with, several things can happen. Sometimes you will gain points, and other times you will lose points. You could also wind up on a picture that will have the program pick the next one for you at random. One of the pictures will reveal the location of all of the others, while another will give you a short rest. Finally, the picture of the "stop sign" will end the game.

Pick Which is an interesting game, but I am unsure as to who it is best suited for. It is too fast paced for very young children, and will probably not hold the interest of older children or adults. I guess the six to 10 year old range would be about right. If you have children in this age range, and would like to try something out of the ordinary, you might want to consider Pick Which.

(Spectral Associates, 141 Harvard Ave., Tacoma, WA 98466, \$9.95 tape, \$13.95 disk)

-Gerry Schechter

Bugger's Talking Intro Not Matched By Graphics

All heads turned toward the computer in our house when, upon loading *Bugger*, a tiny voice originating from my TV monitor cried out for help for a bug trapped in a web with six spiders.

"Wow, what a game this is going to be," was the thought that raced through my mind as we waited for the program to unfold.

What followed was not to match the excitement I originally felt, although the game was challenging. It's another "Pac-type" game with our hero trapped in a maze and defying the odds against some lightning-quick web-weavers.

The object, of course, is to escape the complex alive, which I found to be almost impossible since the spiders' movements are so unpredictable. While you're improving your skills you are able to eat tidbits of food that have been left lying around. The number of tidbits equals your score for a round. Until you're finally able to escape, you'll have to be content with increasing your intake of these morsels.

Maneuverability is managed through use of the arrow keys, which after you have become accustomed to them, prove to be fairly easy to use. I had to unplug my left joystick, however, to get them to function correctly.

There are three levels of play and after each round you are given the choice of a new skill level. I found the game flowed more smoothly by just pressing the ENTER key each time.

Being an old hand at games like *Pacman* and *Doodlebug*, I was not that impressed by *Bugger's* graphics. However, I'll have to admit that the game is challenging and quite contagious. It's a nice game if you're watching your budget.

(Mr. R's Software, 68 Kelly Road, So. Windsor, CT 06074, \$14.95 on tape)

-Charles Springer



= * * CoCo T-SHIRTS * *

HANES QUALITY — TAN WITH COLORFUL GRAPHICS GREAT FOR INDIVIDUALS AND CLUBS

SIZES: SM, MED, LG, XLG CHILDS 10/12, 14/16 PRICES: \$6.95 EA. **OR** 2-5 AT \$6.50 EA., 6-11 AT \$6.25 EA., **OR** 12 & UP AT \$5.95 EA.

SPECIFY QUANTITY AND SIZE WHEN ORDERING SEND CHECK OR MONEY ORDER TO:

CoConut Products

6400 N.W. 34th AVE., FT. LAUDERDALE, FLORIDA 33309 SEND \$1.00 FOR POSTAGE AND HANDLING

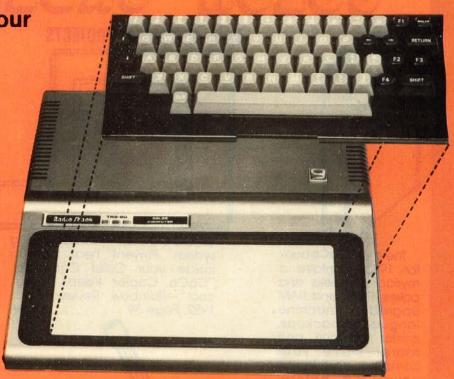
The PROFESSIONAL Keyboard

A direct plug-in replacement for your Color Computer.

- *Simple Installation (No glueing or cutting)
- *Redefinable keys
- *Free Software See page 80 of June 1983 RAINBOW
- *No Extra Charge for TDP/F Model

\$69.95

"A Model 1 keyboard in a Color Computer case. This product is a real gem." Rainbow Review, March 1983 *All TDP/F orders please specify



"The Spectrum Switcher is a fantastic device" RAINBOW review, April, 1983, Page 207



SPECTRUM SWITCHER

\$99.95

Have your Disk and Cartridge too!

Transforms a Color Computer into a dual slot system. Comes with extender cable.

New! Recover your Basic programs — \$10 Tape (Works great with X-PAD and Disk Drive)

SPECTRUM PROJECTS

93·15 86th DRIVE WOODHAVEN, NY 11421 212·441·2807

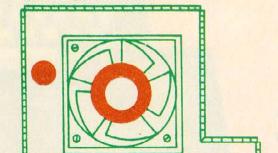
all orders plus \$3 S/H, N.Y. residents add sales tax

GUBLES COLOR

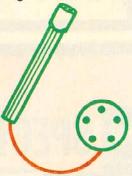
from SPECTRUM PROJECTS



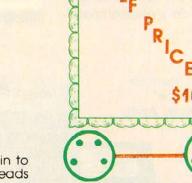
The must CoCobook for 1983. Contains a myriad of peeks and pokes, ROM and RAM upgrades, machine language backups, printer potpouri and more! Make your computer do things it never did before.\$14.95



COCO COOLER-Internal cooling system. Prevent heat buildup inside your Color Computer. "CoCo Cooler keeps things cool."-Rainbow Review, Dec., 1982, Page 39\$49.95



LIGHT PEN-Plugs right in to your joystick port and reads the colors off your screen. Includes four demo programs and is completely compatible with Computer Island's Fun-Pak software.\$19.95



FOUR-PIN MALE TO FOUR PIN FEMALE-15 FEET. Move your printer or modem to another location—easier use...\$14.95

COLOR COMPUTER EDITOR

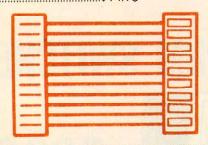
ASSEMBLER AND DEBUGGER

"CCEAD is a high quality program and excellent value. CCEAD is a tool that no

assembly language programmer can afford

to be without." - RAINBOW Review, February,

THE SPECTRUM PADDLE-



DISK INTERFACE/ROM PACK **EXTENDER** — 3 FEET. Move your disks and ROM packs where you want them. Gold plated contacts \$29.95 eliminate corrosion.

HIDDEN BASIC 1.0

Finally! A program written to protect your BASIC programs. HIDDEN BASIC 1.0 will modify your BASIC programs so these commands will not function:

CLOAD or CLOADM CSAVE or CSAVEM **DEL or EDIT** LIST or LLIST

The protected copy is not a BASIC program anymore. It is a special machine language program referenced by the BASIC interpreter. Once protected by HIDDEN BASIC there's no way to undo it! Tape \$19.95

Add \$3 for Shipping and Handling



93-15 86th DRIVE

SPECTRUM PROJECTS

(212) 441-2807 (VOICE)

(212) 441-3756 (DATA)

THE STRIPPER

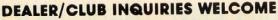
Deletes REMarks, packs lines and removes blanks.

"How much Memory can you save? About 25% average." - RAINBOW Review, February, 1983*

*Order both and save a buck!

Call the Rainbow Connection At (212) 441-3755 & (212) 441-3766 for Rainbow Programs & Reviews

WOODHAVEN, N.Y. 11421



New York State Residents add appropriate taxes



Tired of plugging and unplugging devices from the RS232 port of your Color Computer? Make your life easier. Buy our RS232 expansion cable and connect two devices at the same time. Just right for printers, modems, etc. Anything that plugs into the Color Computer will plug into this high quality cable.

> RS232 Cable RS232 Switcher *3 Position

\$20.00 \$29.95*

COLORCOM/E BONUS! Order COLORCOM/E and get the RS232 cable for only \$15.00. Save \$5.00

32K RAM Button	\$2,99
64K RAM Button—New!	\$4.99
SPECTRUM PUTS THE SLAM ON RA	M
16K Chips	_ \$9.95/set
64K Chips (Spectrum Special)	\$44.95
Nanos System Reference Card	\$3.99
CoCo Memory Map	\$9.00
6883 (SAM) Chip with heat sink	\$29.95
6809E—CPU Chip	\$29.95
Basic ROM 1.1	\$36.00
CoCo First Aid Kit (Be Prepared)	
(2 6821's, 6809E & 6883)	\$69.95
EPROM Programmer (2716, 2732, 2764	The Later Land
and 68764)	\$99.95



Color Computer Tech Manual	\$7.95
Bio Detector-New! Explore the world of Bio	0
Feedback with your CoCo	\$34.95
Epson Printer Interface	\$49.95
Lowercase Board	\$59.95
Hardware Voice Synthesizer w/ VOTRAX Ch	
Unlim ited Vocabulary! (Colorware) Only_	\$69.95
Extended Basic ROM	\$69.95
CoCo Coo Coo (24 Clock)	\$99.95
Color-80 BBS Software	\$115.00
	\$139.95
DRAGON 64 — The hottest selling compute	
England is here and Spectrum's got it! Th	9
DRAGON 64 has both a serial and parall	
Super-Prokeyboard, built-in direct video	output,
64K of RAM and a 51 x 24 screen. Place	
order today!	_\$399.95
oldor loddy:	_7077.70



COLOBGOM / E SMART TERMINAL PACKAGE

WE DIDN'T WAIT for the competition to catch up with us! We've added even MORE features to COLORCOM/E, our superb Smart Terminal program for the Color Computer. Compare before you buy. NOBODY offers you more!

- Complete Upload and Download Support
- Online Cassette/Disk Reads and Writes
- 110, 300, 600, or 1200 Baud
- * Full or Half Duplex
- Preenter Data Before Calling (Saves \$\$'s)
- Offline and Online Scrolling
- * ROM Pack or Disk

- * Automatic Capture of Files
- Send All 127 ASCII Characters From Keyboard
- Word Mode Eliminates split Words
- ★ 7 or 8 Data Bits (Including Graphics Support)
- ★ Efficient Data Storage S-t-r-e-t-c-h-e-s Memory
- ★ 100% Compatible w/Rainbow Connection BBS's!

COLORCOM/E **\$49.95**

AND, our efficient storage and easy editing of received data makes printing to your printer offline a snap. Select any portion of the received data for printing. No need to print everything.



Add \$3 for Shipping and Handling

64K DISK UTILITY PACKAGE

- 40K Tired of seeing 22823?
- 2. ROMCRACK Now place your ROMPAC software on Disk!
- Software Print Spooler Tired of waiting for your printer? Output data to a RAM buffer and go back to programming! Now works with all printers 600 Baud or better!! 64K Disk Utility Package \$21.95 40K program on cassette \$9.95



SPECTRUM PROJECTS

WOODHAVEN, N.Y. 11421

A powerful program that permits the user to easily maintain, backup, and catalog both tape and disk programs.

TAPE UTILITY by Thomas Olk NEW!

- TDR—Tape directory
- 2. COP-Tape to tape copy
- PTD-List tape directory to printer
- 4. DIR-Director of disk
- 5. PDR-Print disk directory
- 6. DTT—Copy file from disk to tape
- 7. TTD—Copy file from tape to disk 8. BAC—**Auto disk to tape backup**! Cassette or Disk-\$24.95

Call the Rainbow Connection At (212) 441-3755 & (212) 441-3766 for Rainbow Programs & Reviews

DEALER/CLUB INQUIRIES WELCOME New York State Residents add appropriate taxes

Genesis Software

Color Computer Programs

*Secret Of The Crypt New!!! to the popular "Enchanted Forest" is here! You'll move in more than 50 hi-res, 3-D graphic scenes searching for clues in an attempt to enter the crypt. But beware, the trail to the crypt is beset with puzzlements. In fact, the crypt's secret will remain a mystery to all but the most adventuresome. Requires 32K extended basic.

Tape cassette (postage paid).....\$21.95

* Bigfoot

Hunt Bigfoot in a hidden maze of caverns and twisting tunnels that are displayed in hi-res graphics as you move. Seek out the lair of Bigfoot while avoiding perils along the way. Features multiple levels and many options of play. Each hunt takes place in a new, randomly generated maze. Challenging and fun. Requires 32K extended basic. Tape cassette (postage paid).....\$21.95

* The Enchanted Forest

The BIG adventure in hi-res graphics. Move through more than 50 scenes on a quest to rescue the captive princess. Decisions are made according to visual clues, not text. There are many inhabitants in the Enchanted Forest - some are friendly, some are not. This is a sophisticated computer adventure — a real challenge. A must for your adventure library. Requires 32K extended basic.

Tape cassette (postage paid).....\$21.95

(The Enchanted Forest was reviewed in the Dec. 1982 issue of Rainbow).

★ The Game Show

Now a lively party game where two teams compete against the clock to name several items in a category. Includes 60 rounds with color graphics and sound. Machine language routine for fast response. Requires 16K extended basic and joysticks. Tape cassette (postage paid).....\$19.95

(The Came Show was reviewed in the Jan. 1983 issue of Rainbow).

Genesis Software

P.O. Box 936, Manchester, Mo. 63011

Personal checks welcome - no delay. Missouri residents add 5.625 percent sales tax.



Software Review

Ambushed By El Bandito (And Enjoying It)

Arcade games come in several fairly standard models. The primary requirements to make a new entry marketable are that it is a new game, there is a new twist or there are some nice bells and whistles. El Bandito, written by David Crandall and distributed by Mark Data Products, is a game that manages to qualify on all three counts. It runs on a 16K CoCo and is played with joysticks.

First, I want to tell you what it is not. It is not, as the name implies, a shoot 'em type arcade game. It also is not, as some

may assume, a trade on anything ethnic.

It is a fast action, maze/chase type arcade game for one or two players. The "Bandito" referred to in the title is your, or your opponent's, picnic ant, which must steal as much food as possible hidden in the maze, and return it to a home lair. There are obstacles, of course.

At the start of each game you have three "ant lives." You select a skill level, and a maze difficulty level, each rated from 1 to 8.

The skill level is easiest to explain. Each level represents the number of spiders which can do in your ant. The spiders randomly (and rapidly) move about the maze; and if they contact your ant, that's the end of the ant life.

The maze remains basically the same, except each higher maze level enables more side passages and escape tunnels. Your ant may use these, but the spiders may not. That sounds good until your ant goes in an escape tunnel, and materializes in a room full of spiders!

Points are awarded for various fruit returned to the lair, only five points for a banana, but a maximum of 100 for an apple. The smallest point award, but maybe most important is only one point, for an ant egg. With that one point, though, comes a bonus life. At the higher skill levels you'll be desperate for those extra lives.

Some things which I did not care for, were that the joysticks respond a bit spongy. After a bit of play, though, it seems almost natural and ant-like for the response to be a little helter-skelter. Also, a score continuation feature for beating the maze would have been nice, but was not included. Finally, you have to shut the computer off to remove the program. (Piracy made that necessary; it's costing us all.)

Some nice features are the ability to freeze and restart play, halt play and start a new game, a continuous "HIGH SCORE" display, and the ability to easily shift from one to two player mode. You can mix skill and maze levels for almost any degree of difficulty you choose. Perhaps the neatest features are (1) simultaneous (non-rotational) play of opponents, and (2) the ant moves slower when carrying food, but may drop it to escape the spiders. With these two, your ant may carry an apple nearly home, only to have to drop it to escape a spider. Then, your opponent's ant picks it up at his door step for an easy 100 points. Fun? You bet. Mark Data has another winner with El Bandito.

(Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, \$24.95 on tape, \$29.95 on disk)

-Gary Smith

COLORFUL UTILITIES

- BASIC AID Speed program entry by single key input of 43 common BASIC commands. Redefine any or all keys. Merge, move and renumber any part of your program.
 Comes with a plastic keyboard overlay. ROMPAK \$34.95/DISK \$49.95
- BASIC COMPILER Convert your BASIC programs into fast efficient machine language. Produces code more compact and up to 50X faster than original BASIC. Integer compiler with no Extended BASIC needed. 16K-64K versions included. TAPE \$39.95
- MDISK Use the upper 32K of your 64K computer as a "virtual disk" for rapid retrieval and storage of data. Save and load up to 15 programs, view directories and kill unwanted files, plus execute programs directly. TAPE \$27.95
- BACKUP64 Make single drive backups of all your disks with half the effort. By utilizing your 64K RAM, only 6 quick swaps are needed instead of a slow 12. Relief for single drive owners. DISK \$14.95
- PRITTY PRINTER Disassemble complex, multiple line statements of BASIC code with this professional program lister. Simple commands control printer baud rates, maximum line length, lines per page and disable form feeds. DISK/TAPE \$19.95
- SCHEMATIC DRAFTING PROCESSOR Save hours
 of work and design professional looking electronic diagrams using a 480X540 pixel
 worksheet with 6 viewing windows. Over 30 electronic symbols with 10 user definable
 symbols are provided. Dump hard copy to the printer and save the created schematics
 to disk. 64K DISK \$49.95
- MICROTERM A terminal program for the new Radio Shack MC-10 Color Computer. Now you can use your PoCo Coco as an inexpensive terminal to access bulletin boards, Compuserve and other data lines. TAPE \$24,95
- MASTERMAIL 1200 Finally a disk mailing list program for serious business applications. Mastermail can store up to 1200 5-line labels per disk, print by code, and uses a very fast machine language sort. 32K-1 disk min. DISK \$49.95

SPECTRUM

SPECIAL 3 or more 15% off!

All order 8 take 15% All order

SPECTRUM PROJECTS

93-15 86th DR ● WOODHAVEN, NY 11421 212-441-2807

All orders plus \$3 S/H - NY residents add sales tax

*** PCLEAR 80 Software..

... offers to the Color Computer Community a high grade of personal service and concern for YOUR system, whether 4K cassette or 64K disk. We have personally used and abused all the programs in this ad. We've been around almost as long as RAINBOW, and we share the same feelings toward the CoCo and CoCo owners as Lonnie does.

With this in mind we offer your choice of the following FREE with any order of \$200 000 cm more.

following FREE with any order of \$20.00 or more.

order totals \$30.00, we will send both.

1) PEEK and POKE file. You know You know you read about that POKE somewhere, you just can't remember where. So you either spend an hour flipping through back-issues, or seconds scanning our handy list.

2) P.D. GRAB-BAG: We've accumulated quite a few P.D. (Public Domain) programs that we don't think should be limited to folks with access to bulletin boards. are some great programs here, including an ON ERROR routine and some nice music. Many are not documented, so expect to do a little work with some. DISK OWNERS NOTE!

There are some great disk utilities here .

If you don't have an order now, we will send you the PEEK/POKE file for \$3.00 and the P.D. GRAB-BAG for \$5.00.

And on with the show!

*** GAMES! ***

 	```````````````
FROGGER (Cornsoft)	\$19.95 TAPE
The official version—and a good one!	*** 05 TABE
MS. GOBBLER 32K (Spectral) LANCER 32K (Spectral)	
DEATH TRAP (Soft Sector Mkt.)	\$19.95 TAPE
A challenging format at an attractive p	
ROBOTTACK (Intracolor)	
THE KING *32K* (Tom Mix)	\$26.95 TAPE \$24.95 TAPE
KEYS OF WIZARD (Spectral)	

BUSINESS -- UTILITIES

TELEWRITER-64 (Cognitec) \$49.95 TAPE This may be the BEST word processor for ANY home computer at ANY price!
T. I. M. S. *E.B.* (Sugar Software)
PEEK & POKE file included.
RAINBOW—WRITER *16K E.B. \$59.95 DISK

\$24.95 TAPE

16K E.B. (Rbow Conn.)

Screen Formatter/Character Generator \$29.95 TAPE with many outstanding features. \$35.00 TAPE

WORKSAVER (Platinum Software)
The best of all the programmer's utilities.
TAPE TO DISK (Tom Mix) \$17.95 TAPE

TAPE TO DISK (To TAPE DUPE (Tom Mix) \$21.95 TAPE ************************

ALL PROGRAMS 16K NON-EXT. UNLESS NOTED

NOW AT PCLEAR 80... COLOR COMPUTER NEWS. \$2.95 WE ALSO CARRY THE COLOR COMPUTER MAGAZINE \$2.95 CALL AFTER 6 P.M. ABOUT 64K UPGRADES AND OTHER HARDWARE MODS.

SEND \$.50 IN STAMPS OR COIN FOR YOUR CATALOG TODAY. (REFUNDABLE WITH ORDER).

VISA

PCLEAR 80 SOFTWARE. 494 Cline Avenue Mansfield, OH 44907 (419) 756-4873

Note: We also carry the RAINBOW



Add \$2 shipping on orders less than \$50. Please add \$2 for COD. Ohio residents add 5% state sales tax

Old McDonald's Farm Vowels A-E-I-O-U

Old McDonald's Farm Vowels is an educational drill program for beginning readers in kindergarden through the second grade. The goal of the program is to teach vowel sounds to the young reader. The program is written in machine language and requires 16K ECB.

As soon as I began reading the instruction manual, it was obvious that this was a well-documented program. Much effort was put into the development and writing of the manual. After reading the instructions only once, I thoroughly understood what the program was supposed to do and how to use it. (If only the instructions for putting Christmas toys together were half as good.) The author uses detailed examples and portions of actual screen displays to describe the program in the 11-page manual.

Old McDonald's Farm Vowels does exactly what it claims to do and that is to drill the student over the long and short vowels. Initially, each vowel is pronounced in its long and short form and then used in a word. Next, the word is used in a sentence to provide the proper context. After this short tutorial, the drill practice actually starts. The student is presented a graphic display of a farm animal such as a dog, goat or pig. The tape player is then turned on automatically and a voice articulately pronounces the name of the animal and asks the student to indicate whether the vowel was used in its long or short form. To respond, the student only has to push either the right or left arrow key.

Correct responses are rewarded by a smiling face and "Old McDonald's Farm" is heard. If a response is incorrect, the student is given a clue and prompted to try again. Once the correct response is given a smiling face is seen. Negative reinforcement is never used. Scoring is kept at the bottom of the screen. The scoring format is handled nicely and allows the parent or teacher to easily determine which items were missed on the initial try.

Old McDonald's Farm Vowels has excellent graphics and the author used good creativity in designing the format of presentation. There are several bells and whistles that make the program interesting, and each one adds to the educational value of the program. They are:

- 1) The score is constantly displayed on the screen so that. the student can see his progress.
- 2) A surprise graphic is displayed at the end of the exercise if the student gets all items correct.
- 3) The exercise can be made more or less difficult by changing the allowed response time.
- 4) The scoring display provides a record of correct and incorrect responses.
- 5) The correct arrow key responses are randomized to help eliminate positional memorization of inputs.

If you are looking for a good educational program for your child, I think this would make an excellent collection for your library.

(Teksym Corp., 14504 County Road 15, Minneapolis, MN 55441, \$14.95 on tape)

-Michael K. Hunt

"BREAKING ALL **SALES RECORDS**" **Bob Rosen**

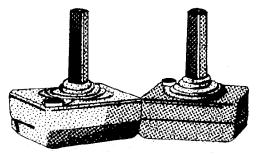
THE games on his CoCo." RAINBOWReview. March 1983 STICK INTERFACE*

;**********************************



Now you can hookup two Atari* type joysticks to your Color Computer or TDP System-100 for only \$19.95

\$39.95 - The Interface with two Atari* joysticks



* Interface made by WICO. Atari is a registered trademark of Atari, Inc.

YES!	PLEASE SEND: () INTERFACEs \$19.95 () STICK/INTERFACE SETs \$39.95 all orders plus \$3 shipping
NAME	

ADDRESS. CITY, STATE, ZIP.

N.Y. residents add sales tax

"Recommend

anyone who enjoys

;***********************

SPECTRUM PROJECTS

93-15 86th DRIVE WOODHAVEN, NY 11421 212 - 441 - 2807 (continued from page 14)

One of the things which has confounded me for some time now is why we do not get more submissions from teachers, their students and from computer classes and/or clubs in schools.

In thinking about that, it seems to me that one of the reasons may stem from the same reason as why we do not get more submissions for non-Extended Color BASIC programs.

I have long believed the reason we do not get non-Extended programs is because most of the people who have non-Extended CoCos are beginners. And, seeing the many well-written and innovative programs we publish, they feel their own efforts might not be "up to snuff" for us to use.

By the time someone upgrades to Extended, he has some expertise and feels more comfortable making a submission. And so, many of the programs you see in *the Rainbow* are for Extended.

We were all beginners. And I want to say here, for the record, that we encourage the submission of non-Extended programs. Often, I find, beginners have some of the freshest ideas and do some of the most creative programming.

As to youngsters, many of them are beginners, too. But I am frankly surprised that we have not seen more submissions from them.

One of my long-time interests has been for a youngsters' section. We at *the Rainbow* are most interested in encouraging young people and their use of CoCo. Such a section could be devoted to their programs — and would be an interesting outlet for young people to share some of their programs, ideas and techniques.

We would like to have a section of this sort, but can do so only with your help. If you are a youngster, please send a program or two to our Submissions Editor. And, when you do, please let us know how old you are. OK?

And, for all the teachers and students who are reading this: Why not make it a project this fall to do something for



YALHALLA



VENTURE WITH YOUR LEGIONS INTO THE MYSTICAL LAND OF VALHALLA TO CONQUER ALL AND REIGN SUPREME IN THIS TOTALLY HI-RES, COMPLETELY JOYSTICK CONTROLLED, STRATEGY GAME. THE BEAUTIFULLY DETAILED TERRAIN MAP INCLUDES CASTLES, VILLAGES, ROADS, RIVERS, SWAMPS, LAKES, BAYS, AND MOUNTAINS. TWO TO FOUR PLAYERS CONTROL SIXTEEN ARMIES LED BY LORDS, GENERALS, OR CAPTAINS. EACH ARMY FEATURES HEAVY CALVARY, LIGHT CALVARY, FOOT SOLDIERS, AND ARCHERS.

A SUPERB GAME FOR ONLY \$24.95.

CHECK OR MONEY ORDER ONLY

HYCOMP

P.O. BOX 15331 TULSA, OK 74158 (918)266-6452

ALL ORDERS 1.50 SHIPPING. GAMES REQUIRE 32K, EXT. BASIC, AND DUE TO MEMORY REQUIREMENTS ARE AVAILABLE ONLY ON CASSETTE



COLONIAL TRILOGY



THE INCREDIBLE SAGA OF THE STRUGGLES

BETWEEN TWO RACES AT THE EDGE OF OUR GALAXY

COLONIAL WARS: ONE PLAYER COMMANDS THE COLONIAL HOMEWORLDS AND ALL THEIR FORCES WHILE THE OTHER PLAYER LEADS THE INVADING ZYRON EMPIRE. THE ULTIMATE IN TWO PLAYER STRATEGY GAMES WITH HYCOMP'S UNIQUE SPLIT SCREEN CONCEPT, GAME SAVE, AND 10 PAGE INSTRUCTION MANUAL(3-8hrs)

ZYRON: THE SIEGE OVER ONE OF THE COLONIAL HOMEWORLDS AND THE ATTEMPT TO BREAK IT IS THE SETTING FOR THIS TWO PLAYER GAME. FEATURES INCLUDE CUSTOM BUILT FIGHTERS AND FREIGHTERS, 300 LOCATION HI-RES PLAYING GRID, SEVEN PAGE MANUAL, TWO SCENARIOS, AND PLAYING AID (2-4hrs)

QUESTAR: ONE PLAYER EXPLORES OVER 30 PLANETS ON A DARING MISSION TO DESTROY A HIDDEN ZYRON BASE IN THIS EXCELLENT GRAPHICS ADVENTURE (60-90min)

ONLY \$19.95 EACH OR ALL THREE FOR \$49.95! RAINBOW

submission to the Rainbow? No, we certainly cannot guarantee we will print everything — but if we get sufficient response we can institute a special feature each month — perhaps with photos of the class at work.

I want to report here a story which reaches me with mixed emotions.

No doubt you have seen me mention the name of Jon Shirley, the vice president for computer merchandising for Radio Shack, in this space before. Jon announced this month that he is leaving Radio Shack to accept a position with Microsoft, Inc. in Washington State.

All of us owe a debt of gratitude to Jon Shirley. It was under his administration that the Color Computer came to be and it has been through his work that CoCo has become a "word" in so many thousands of households. Thank you, Jon, from so many of us.

Next month will mark the beginning of our Second Annual Adventure Contest! The first contest was one of the highlights of the year for us and we look forward to another great one.

You will see the formal announcement next month, but it might be wise to start considering an entry now. I believe you will be impressed with the prize list.

And, speaking of contests, the Simulation Contest has some really excellent entries. We'll be naming the winners soon and printing their programs. So, stay tuned.

Judging from my mail, it appears that the record in the Anniversary issue was an unqualified success. With a few exceptions, everyone who wrote (and there were hundreds of you who took the time to do so) thought binding in a record was an excellent idea.

The proposal that we increase the price of the Rainbow to finance a record each month generated comments ranging from wild enthusiasm to concern for cost. And, the bottom line appears to be that we will not do it as a regular feature.

The reason is simply that the record adds something like 25 cents to the cost of every magazine, once the manufacture, binding, mailing and other associated costs are taken into account. That, coupled with two additional facts, makes it an unwise move on our part.

Fact One is that the cost to us I quoted above is based on what is, essentially, a three-program record. To do more would cost considerably more.

That, in and of itself, seems to be satisfactory to a majority of those who wrote. But Fact Two is simply that we are forced to raise our cover price next month, anyhow. Effective with the October issue, single copies of *the Rainbow* will cost \$3.95. There is no change in the subscription price.

Why are we raising the cover price? First, because the cost of paper has gone up again, as has the cost of just about everything else that we do. The \$2.95 cover price was set a year ago this month — when we had 106 pages. The number of pages has tripled since then.

The second reason is that shipping costs have increased as well. Part of this is due to rate increases. The other to the sheer size of *the Rainbow*. Last month's issue weighed in at over 20 ounces!

Will there be a subscription price increase? Yes, in time. But, before we do, we will let you know here — and give you to opportunity to extend your subscription at the present rate. For now, though, our increase in price affects only single copy sales.

-Lonnie Falk

SPECTRUM SPECIALS

Rompak w/Blank PC Board\$9.55
The Disk Doubler-Doubleside your disks\$12.95
Video Clear- Effective RFI\$14.95
Video Plus- Superb Video Interface\$24.95
16/32K Upgrade Kit - Lowest price \$25.95
The Spectrum Joystick\$39.95
Wico Analog Joystick - THE BEST! \$49.95
Mark Data Keyboard\$58.00
Maik Data Keyboard
Botek Printer Interface\$69.95
Botek Printer Interface\$69.95
Botek Printer Interface\$69.95 "Gorilla" Hi-Res Green Screen Monitor\$99.95

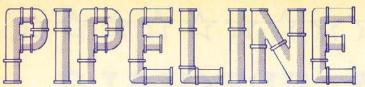
CALL 212-441-2807

ALL ORDERS PLUS \$3.00 S/H
N.Y. RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

93-15 86th DRIVE WOODHAVEN, N.Y. 11421





Not one, but two new Color Computers are in the fall lineup from Radio Shack.

The 64K Color Computer, (see cover) from an "inside" point of view, merely confirms what many of us have known for a long time—that just by making a few internal changes the "32K Color Computer" could become, in effect, a 64K machine.

However, the introduction of the 64K CoCo also coincides with the introduction of the OS-9 software package, providing a true disk operating system from Radio Shack for the first time. Yes, OS-9 has been rumored for many months, too. But, now, here it is.

And make no mistake about it—it's a full-fledged disk system based on the popular UNIX system (the Bell Telephone Laboratories operating system for large minicomputer systems). It comes with an editor, assembler and a debugger. With four hefty manuals to explain things.

This month's Pipeline is devoted to Radio Shack's two new Color Computers. An artists's sketch of the Color Computer 2 appears above.

Photos of the 64K CoCo and an indepth view of the OS-9 appear on page 236.

Not completely expected is the second major Radio Shack CoCo—the Color Computer 2. It is smaller than the "traditional" CoCo, thanks, primarily, to some excellent design and engineering at Tandy Corp. And, with one single exception, it is electrically the same as its larger brothers.

What do these two new CoCos have in common?:

For one thing, their color. It isn't white, but fawn gray—an off-white if you will.

For another, both feature a new keyboard—with threecolor sculptured keys which have more "travel" than the "old" CoCo keyboard.

And, both are, essentially, software compatible with every Color Computer which has ever been produced (TDP-100s, too).

But, much more than that, the new Color Computers position Radio Shack squarely in the middle of the personal computer market for some time to come. These are well-built machines, based on the state-of-the-art 6809 microprocessor from Motorola. Especially with their new colors they are attractive, durable and—because of the software capability—come to the marketplace with a vast library of programs which can be run today.

The 64K CoCo featured on this month's Rainbow cover is available now from your local Radio Shack. So, too, is the OS-9 software. The computer sells for \$399 and the software for \$69.95. (For more details on OS-9, see technical editor Dan Downard's article on the new 64K CoCo in this issue).

Color Computer 2 should be available within weeks. The



non-Extended BASIC version will retail for \$239.95. Extended BASIC goes for \$319.95. And, yes, you can buy the keyboard separately—for \$39.95 plus installation.

The 64K CoCo

There is really no internal change between the 64K Color Computer and the one which Radio Shack has been selling for some months. One of the worst-kept secrets for some time has been that the 32K Color Computer was equipped with 64K chips which, like as not, with some little modification, could support a "bank-switched" system.

By "bank-switched" we mean that either half of the 64K of RAM could be accessed at a time. Programmers soon found ways to use the "other" half of the RAM for several different purposes—everything from storing variables to using that part of the memory as a disk-like storage area for whole programs.

Additionally, a number of language systems, with FLEX being the most popular, were able to use the whole 64K. OS-9 will operate in the same way.

This, incidentally, is no different than the "64K computer" advertised by other firms, such as Commodore. What the Commodore lacks, among other things, is a state-of-theart microprocessor like the 6809. And a sophisticated operating system.

A look at the motherboard of the new 64K CoCo shows it to be, essentially, no different than the ones already for sale by Radio Shack. Some capacitors have not been installed and the jumpers are set to 64K at the factory. That is what we have been telling you for months you should do to "upgrade" your F-Board CoCo from 32K to 64K. Of course, the 64K chips are included—and certified 100 percent.

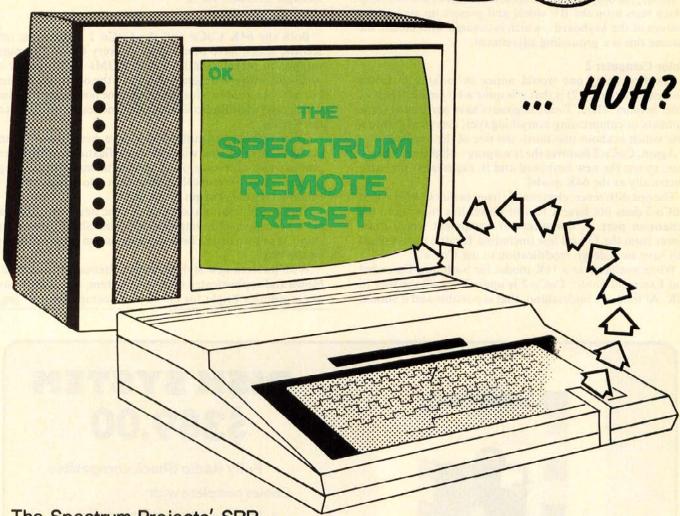
Electrically, this is the same computer with some cosmetic changes. But what changes!

The new color should make CoCo a much more welcome addition to the home. It blends in with most any decor. And, because the color is moulded into the plastic cabinet, you end up with a machine from which the color will not wear off. It should be easier to clean, too.

The keyboard is a great improvement. The keyboard colors—white, fawn gray and red—blend in well with the case itself. The keys are wider, flared out, and have better tops than the previous ones available from Radio Shack.

They have more "travel" too. That is, they move further down when pushed. Though they stop somewhat short of

NOW... RESET THE BACK FROM THE FRONT:



The Spectrum Projects' SRR provides easy access to your system reset and eliminates the need of reaching around cables and components or moving the computer.

Installation of this sturdy device is simple, quick, requires no tools and voids no warranties.

Put control back where it belongs, at your fingertips for only \$12.95 plus \$2.00 S/H.

ZEC	PLEASE SEND
YES	() REMOTE R

() REMOTE RESETs... \$12.95

NAME _

ADDRESS __

CITY, STATE, ZIP _

ADD \$2.00 S/H & SALES TAX

SPECTRUM PROJECTS

93-15 86th DR. WOODHAVEN, NY 11421

212 • 441 • 2807

what a touch-typist would consider "full-travel," they are a vast improvement for one of the areas which spawned the most complaints about the original CoCo. Their color coordination gives them, and CoCo, a more complete look, too.

And, while the only other change is the location of the Radio Shack logo, the color somehow makes the new CoCo look more sleek. We spent several minutes comparing the "battleship gray" and fawn gray models before reaching the conclusion that there is no difference between the cases. Yet, the new one looks "better," somehow.

Inside, the only difference is the existence of a bronze clip which rests atop the RF shield and presses up against the bottom of the keyboard—which is covered with metal. We assume this is a grounding adjustment.

Color Computer 2

The first thing one would notice in looking at Color Computer 2 (CoCo 2) is that it is quite a bit smaller than its older brother. Here, Tandy engineers have performed some wonders in compressing everything (yes, everything) into a case which is about two-thirds the size of the original.

Again, CoCo 2 features the fawn gray—slightly sleeker—case, sports the new keyboard and is, essentially, the same electrically as the 64K model.

The one difference, electrically, from earlier CoCos is that CoCo 2 does not have a 12-volt power line running to the expansion port. A few pieces of equipment which draw power from the 12-volt line (including Tandy's own X-Pad) will have to undergo modification to use CoCo 2.

While available as a 16K model for both non-Extended and Extended BASIC, CoCo 2 is upgradable all the way to 64K. At least, we understand, that is possible and it should

be, because CoCo 2 has the same logical workings (and chips) as does every other Color Computer thus far sold.

It is almost worth breaking the factory seal and voiding your Radio Shack warranty to see how it was done. Some of the ideas are easy to spot—others buried in the well-designed motherboard. One of the most obvious is the turning of the RF modulator on its side. It now takes up less than a third of the space on the board.

CoCo 2 should be a big seller. It is nice looking, compact, and priced right. It is upgradable and, again, has a wealth of software available for it.

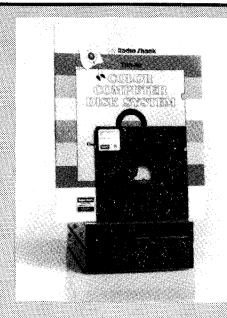
New ROMS

Both the 64K CoCo and the CoCo 2 feature the new ROMs, which have been a part of every Color Computer shipped in recent months. These ROMs fix a number of problems with the original version of the operating system, but may be a problem for some machine language programs which used what Radio Shack calls "undocumented" calls to the ROMs.

Most software manufacturers have been aware of the problem already, and will offer modifications to their programs when necessary. As a service to machine language programmers, Technical Editor Dan Downard, offers a rundown on the changes to the ROM.

Those lucky enough to have seen the new CoCo thus far have been favorably impressed. Radio Shack, we understand, is bullish on the two new models and more support is on the way.

With its sleek new styling, model alternatives and a full-blown and sophisticated operating system, we see the future as exceedingly bright for our favorite computer.



We have a complete line of color computer products

Call or write for free catalog

COD's • Visa • Mastercard accepted

\$389.00

Fully Radio Shack compatible

Comes complete with:

- Attractive cabinet and power supply
- Tandon TL-50-I Disk Drive
- Disk control board and Rom software
- Radio Shack disk basic manual
- Diskette
- Fully assembled and tested, just plug it in!!!
- Dealer inquiries invited

Second Drive with Cable...\$319.

MICON ENTERPRISES

714/841-4210

7248 HEIL AVENUE HUNTINGTON BEACH, CA 92647

Fast Reflexes? You'll Like Fast Lane

When I first read the directions for Fast Lane, the idea of the game intrigued me. After playing the game for several hours with a few friends, we all decided it was rather hopeless.

Fast Lane is a machine language, arcade-type game, the idea of which is to steal weapons from the enemy. When the game begins, you find yourself on the right side of a screen full of space traffic. You must maneuver your spaceship, using the arrow keys, to the left side of the screen. The faster you accomplish this, the more fuel you will save, and the more points you will receive. Having done this, you now go to the second screen. Here you have entered the enemy spaceship which has electrified walls and moving guards. You enter on the right side of the screen and must get through the rooms via the doors, which open and close, to the weapon in the upper left corner. After you get the weapon you must return it to the lower right corner. Again, you must do all of this before your fuel runs out.

If you succeed in stealing the weapon your score so far, will be shown. You then push the spacebar to go to the second level which is supposedly more difficult. You can push the "P" key to pause your game any time during the play.

The biggest drawback to this game is the fact that it uses the arrow keys for movement. It would play much smoother and faster if it used the joysticks. The directions say, "you should only tap the arrow keys" to move your spaceship. However, even in tapping, (especially for right-left movement,) the keys are just too sensitive. You will usually end up smashing into a wall.

Fast Lane requires very fast reflexes, which I don't have, so I invited some friends to try their skills. Of four different people trying the game for a couple of hours, the highest scorer got 93 and she was only able to get through the first screen.

The graphics are fairly good, but simple—nothing spectacular. Rating the game on a scale of I (worst) to 10 (best), I would have to give it a 4. It is a game you easily get frustrated with before you get good at it.

(Acesoft Computer Products, 1680 North Page Drive, Deltona, FL 32725, \$24.95 cassette)

-Jim Stewart

M&S - SOFTWARE SAVES YOU MONEY!

ORDER NOW AND SAVE 10% ON AN ORDER OF TWO PROGRAMS ORDER THREE PROGRAMS AND SAVE 15% OFF THE TOTAL

THE DOT PAINTER
is an easy way to High
Resolution. Draw dot-by-dot
lines by holding down two
keys (Erase the same way)
on tape or disk for \$19.95!

NEW - Dan Mickie's DOT+PAINTER LEV

Use your Lasers or Space Torpedoes to destroy the MERZOID enemy, but don't forset to set your shields or repair damage. Lose computer control and drift into a Black-Hole or Star Life Support, Warp Drive, Other Options

Best TREX Program & Oct.82 PAINBON

STAR, 16 or 32K PILOT \$ 19.95

M&S PAYS SHIPPING

Visit The DUNGEON MAZE.
Save The PRINCESS. Can
You Escape Alive? Only
By Usins Certain Masic
Items Found In The Maze!
See Review In Nov.82 RAINBOW
NEW MAZE!

Requires 32K EXTENDED事24.

WATCH FOR DUR SOON-TO-BE-RELEASED ALL-DISK HI-GRAPHIC SPY-ADVENTURE

EDITOR, 22 FUNCTION TEXT-PROCESSOR \$14.95

Hould you like us to sell YOUR program? We will - do it on a royalty or consignment basis

LOOKING for a certain type program? Let Us Kaoss

-ORDER NOW!

Personalized Checks Accepted With NO Waiting Period

M&S Influare
No.1 Sunset Drive Lodi, OH 44254

'Cooling It' Is A Breeze With CoCo-Cooler

It has just occurred to me that I now have a minimum of six switches to turn on just to get my CoCo up and running. I have to turn on the monitor, Drive 0 and Drive 1, the multi-pak interface, the computer itself and CoCo-Cooler—the subject of this review.

Well, six switches or not, since installing a CoCo-Cooler on our 4K turned 64K machine, I would hesitate to use the CoCo without it—reason being that it very effectively covers all the air vents on the left side of the computer and, thus, if unused it would make the machine get even hotter than it did prior to installation.

Who needs a CoCo-Cooler? Let me tell you, I practically had to be hit in the head with a board to become convinced I did. You see, I'm not one who stays up nights worrying about replacing the SAM chip if it should overheat. And, several weeks ago when I noticed some weird stuff happen-

-NEW! FROM THE PROGRAMMER'S GUILD -DEMON'S DEFIANCE

Fresh from the fertile imagination of BASIC Graphics Master—Fred Scerbo; **DEMON'S DEFIANCE** is a riot of color and action. Trapped by the Demon's Energy Shield, the rebels tried desperately to blast their way to freedom but the Winged Horror hovers overhead and reigns down destruction.

Who will emerge victorious?

For 16K CoCo or 4K MC10 . . . cassette \$14.95

TRI-PLANETARY HANGMANOIDS

HANGMAN as you've never seen it. Spell the word correctly before the Hangmanoids' KILLER SHIP can be assembled. If not, the earth lies doomed. Graphics, sound, top fun the way you like it.

For 16K CoCo or 4K MC10 . . . cassette, \$14.95

SPECIAL INTRODUCTORY PRICE BOTH GAMES \$25

Specify computer Send check, MO or VISA, MC # to:

> THE PROGRAMMER'S GUILD P.O. BOX 66 PETERBOROUGH, NH 03458

> > (603) 924-6065 (COD add \$3.00)

ing on the screen, I immediately blamed it on the disk controller—which deserves most all of the blame it gets, except this time.

Though the top of the machine was hot enough to cook an egg on, I exhausted every remedy before deciding that maybe—just maybe—I might be suffering from that dreaded malady "hot CoCo," (tacky, but irresistible). Well, CoCo-Cooler cooled my machine and my temper.

As advertised, CoCo-Cooler takes about one minute to install; you just remove the protective strips covering the adhesive, align it with the side of the machine, press it into place and plug it into a wall outlet. That's it. The CoCo-Cooler is contoured to fit snugly in place and the adhesive will sure enough keep it there, once placed, so don't misalign it.

In use, the CoCo-Cooler keeps things cool and calm inside your machine, even if a "basket case" is pounding the keyboard. While I haven't gone to the extreme of placing thermometers inside and outside the CoCo to test CoCo-Cooler's effectiveness, the top of the machine is now cool to the touch whereas it had been markedly warm before. According to figures supplied by the manufacturer, REM Industries, Inc., in tests during which room temperature was controlled at 80 degrees, temperature readings were taken on the computer case surface just above the power supply and, without CoCo-Cooler, a 16K machine's temperature rose to 98 degrees while a 64K machine hit 110 degrees. With CoCo-Cooler then attached, both machines cooled off rapidly in 15 minutes—and at the end of an hour the 16K machine registered 84 degrees while the 64K machine had leveled off at about 88 degrees. What more can you ask? Well, maybe a couple of things.

While I have no complaint about CoCo-Cooler's effectiveness, I do wish the fan was a bit quieter. True, it makes no more noise than my electric typewriter does—but, then, I turn my typewriter off and on several times a day just so I don't hear that, albeit slight, extra noise or feel the vibration. Personally, I think a smaller fan might do the job just as well and perhaps a measure quieter. Both the fan housing and the fan blade itself are made of high impact plastic and offer little chance of tiny fingers getting into the wrong place. All in the cause of consumer safety, however, I deliberately stuck my finger into the fan and, I'm glad to report, the blade stopped easily.

While it poses no problem in my particular situation, I should point out that the CoCo-Cooler does extend five inches out from the left side of the computer—about the same distance the disk controller juts out on the right side. This could possibly pose a problem for those with compact installations—the very same people who are most likely to have overheating problems.

All in all, CoCo-Cooler does exactly what it is supposed to do and it does have the professional look of a quality piece of hardware that is designed to do a specific job as efficiently as possible. Individual circumstances will dictate whether you do or don't need a cooling fan for your CoCo, but, if you do, CoCo-Cooler is as welcome as a cool breeze.

(REM Industries, Inc., 9420 "B" Lurline Ave., Chatsworth, CA 91311, \$39.95)

-Jim Reed

Mathmenu — A Cornucopia Of Mathematical Programs

By Dr. David Finkel

Do you solve mathematical problems in your job? Do you need help with your math homework? Or are you just interested in exploring mathematics? If you answered "yes" to any of these, then you ought to consider *Mathmenu*, from Inter+Action. As a mathematician (Dr. Finkel teaches mathematics and computer science at Bucknell University.), I enjoyed using these programs; perhaps you will, too.

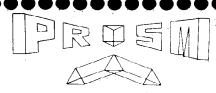
Mathmenu is a collection of 15 mathematical programs, ranging in size from about 1K to over 9K. They are all well-written, well-documented, and—with a few exceptions mentioned below—present mathematically valid approaches to solving problems.

The most impressive of the programs is the surface plotting program, $3D\ PLOT$, which draws high resolution plots of three-dimensional surfaces on the PMODE4 screen. The program begins with a menu of choices. One choice gives you several screens of information on how to use the program. Another allows you to enter the function to be graphed. You do this by entering Y as a function of X and Z in standard Color Computer notation, like Y = X*X + SIN(X).

In addition to specifying the function, you have to specify the range of X and Z values to be shown on the screen; these automatically determine the range of Y values. You can also, through the use of the Special Features Menu, control the Y axis scale, the Z axis scale, and the graphing resolution. All these options make for a flexible and powerful graphing capability. You might have to try several different settings of the graphing parameters before you get the graph just right. Fortunately, it's easy to do this; you can return to the menu at any time, erase the current graph, change parameters, and start graphing again, all in a few seconds. You also have the option of graphing more than one function on the same screen.

Once you get a graph just the way you want it, you might like to save it. You can save graphs to tape or disk through the Special Features Menu, which guides you through the necessary steps. The *Mathmenu* package comes with two sample graphs already saved, but I wasn't able to load either of them. However, the graphs I saved to tape myself loaded without any problems. One way to use this save to tape or disk feature is for class demonstrations. You can spend all the time you need beforehand getting the graph to look the way you want, and then demonstrate the finished product. And, you can use it to impress your friends.

This 3D PLOT program is easy to use, clearly documented and very useful. I do have some suggestions for its improvement, though. First, the axes are turned around from what's standard in math books. Usually, three-dimensional graphs are drawn with the Z axis going up, the Y axis going to the right, and the X axis coming out at you. There's no special reason for this arrangement, but it is



TOP QUALITY CoCo SOFTWARE
We Sell The Best Products
from

- *SPECTRAL ASSOCIATES
- *MARK DATA PRODUCTS
- *MED SYSTEMS SOFTWARE
- *INTRACOLOR
- *COMPUTER WARE INC.
- *TOM MIX SOFTWARE
- *PROGRAMMER'S GUILD
- *PRICKLEY PEAR INC.
- *SUGAR SOFTWARE
- *BUMBLEBEE SOFTWARE

and Our Own Quality Software

Send for Your

FREE CATALOG Today



BONUS:
If you order \$30 or more
from PRISM before
AUGUST 31st
you get a FREE

pair of C-10 Cassettes!

We Accept

cards

Authors:

WE PAY
TOP ROYALTIES
ON BOTH M.L.
AND BASIC GAMES.
IF YOU HAVE A
GOOD PROGRAM,
SEND IT IN AND
WE'LL TAKE A
LOOK AT IT

- *Dealer inquiries welcome
- *All software on tape
- *Add 5% for shipping *No C.O.D. please
- *Ontario residents please add 7% sales
- *Allow 2-3 weeks for delivery

Prism Software

Box II82,

Kincardine, Ont.

Canada

NOG 2G0 Tel:(5l9)396-8224

Watch for Coming Ads with Great Great Specials!

TELL US WHERE YOU SAW THIS AD AND GET 5% OFF!



standard; look in any calculus book. *Mathmenu* has the axes turned around. Also it has Y as a function of X and Z, instead of the usual Z as a function of X and Y. Finally, it would help if there were more examples of how to use the various graphing parameters. This program has many powerful options and some examples would help the novice learn how to use them more quickly.

In addition to 3D PLOT, there are 14 other programs in this package. I'll describe them in less detail.

2D PLOT works like 3D PLOT, but does two-dimensional plotting. It's somewhat easier to use, since two-dimensional plotting is simpler than three-dimensional plotting. It also offers the save to tape or disk feature.

MATRIXOP and VECTOROP do matrix and vector calculations, on matrices up to size 8 by 8, and vectors with up to 20 entries. They perform all the calculations you might like: matrix sum, difference, and product; transpose, inverse, and determinant; and vector sum and difference, cross and dot product, length of a vector, and angle between two vectors. The calculations are all done with good accuracy, subject to the limitations of the Color Computer's numerical operations—about eight accurate places. Since matrix calculations can involve a large number of individual calculations, the small round-off error from each one can accumulate and cause a significant error in the final result. This is especially a problem if the matrix contains both very large and very small entries. Use the results from such calculations with caution.

There's an unfortunate bug in MATRIXOP. If you enter a singular matrix—that is, one whose determinant is zero—the program correctly identifies the matrix as singular, but then prints out a non-zero number for the determinant. The author assures me that this bug is being corrected.

Two programs perform numerical calculus functions. NUMDIFN calculates approximate derivatives, and NUMIN-TEG calculates approximate definite integrals. The derivative at X is approximated by (F(X+h)-F(X))/h, where h=.00001*X. Because of this fixed formula for h, the approximation may be unreliable if the derivative or the value of X is large. NUMINTEG approximates the integral by Simpson's Rule. In this program, you choose the number of intervals, so you can make the approximation as accurate as you like.

The program LSTSQRS finds the best fitting curve to a set of up to 100 data points. After you choose whether you want to fit a linear, quadratic, or cubic curve, the program displays the best fitting equation, according to the usual least squares calculations. If you want to do serious analysis

of curve fitting problems, you'll probably want more than this program offers: more kinds of curves, a graphics capability, and ways of examining how well the points fit the curve. But LSTSQRS does a good job of basic curve fitting.

There are two other programs that are a lot of fun, although it's hard to imagine practical applications for them. LG#ADD and LG#MULT add and multiply large numbers exactly, with no round-off error. LG#ADD handles up to 100 digit numbers, and LG#MULT up to 30 digits. Whether or not you need to do calculations with 100 place accuracy, it's nice to be able to, just to show off.

There are six more programs that do fairly routine calculations. QUAD EQN finds the roots of quadratic equations, PRIME CK checks numbers up to one million to see if they're prime or not, BINOMEXP calculates binomial coefficients, BASECONV converts numbers from one number system to another, for example from decimal to hex, RECT-POL converts coordinates between the rectangular and polar systems, and RPL allows you to use your Color Computer like a Reverse Polish Logic calculator. All these programs are easy to use, and perform their functions accurately.

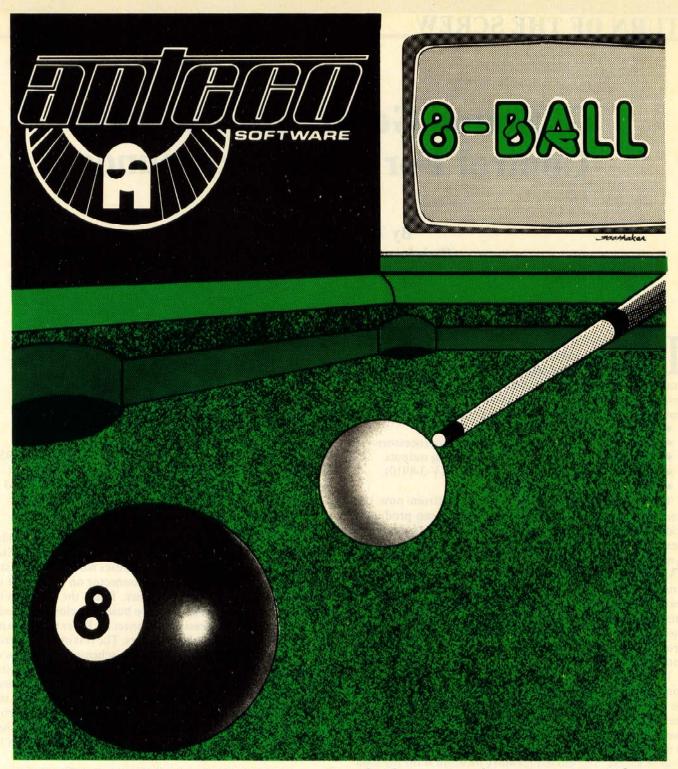
All the programs in *Mathmenu*, except for the graphing programs and *RPL*, allow you to print the results out on your printer. The graphing programs include instructions for using your own screen print program to print out the graphs you've created.

Throughout the package, the on-screen instructions are outstanding. Each program includes instructions explaining what the program does and how to use it. Clear prompts are given for entering the data, and for starting the calculations. The printed documentation is adequate, but would be improved with the addition of more examples, especially for the graphing programs and for *RPL*.

And now for the big question: should you buy Mathmenu? First, the programs in Mathmenu are excellent. They provide a wide range of useful mathematical functions in an easy to use format. Second, the price is a real bargain for a package of 15 programs. The two graphing programs alone are well worth the price. So, if you have use for even a few of these programs, for work or school or your personal interest, you'll get your money's worth from Mathmenu.

(Inter+Action, 113 Ward St., Dept. R, New Haven, CT 06519, \$44.95 for 16K tape, \$49.95 for 32K disk, ECB)

TDP-100, 16 K from \$26 100% TRS-80 Color Con compatible. Comes with of Joysticks and a rompa	puter parallel printer. 12 pair 3K buffer, hi-res gra	by DCS Software. 32K ext. basic req'd. Just like Gravitar in the arcade. Hi-res graphics, 6 colors, sound. Only \$19.95 cassette
		\$69 We carry ALL Color Computer
TRS-80 Color Computer (TDP) Disk Drives Drive 0 \$415 Drive 1 \$245 Wabash Diskettes. 1 y warranty. Certified 100 error free, w/hub rings. SS/SD \$17.50/box SS/DD \$19.95/box		oo% Intracolor, and more. Up to 25% gs. discount. Call for more infol



REALISTIC ACTION FEATURING--- Bank Shots, Combinations, Engish on the Cue Ball.can be played by 1 or 2 players. Ask your friend to chalk up, the action is fast. Now at your Software Dealer, if not have them call

ANTECO 4220 Clay Ave. Fort Worth, Texas 76117 1-800-433-7631 ANTECO division of Antenna Electronics Co.

GI Sound Generator: Software Control For Complex Sounds

By Tony DiStefano Rainbow Contributing Editor

ast month's project was a practical one. This month we'll have some fun. How about making some interesting sound effects? Well, I'll show you how to interface the General Instrument's programmable sound generator number AY-3-8910 to the Color Computer. The features of this chip according to GI are:

- Full software control of sound generation.
- •Interfaces to most 8-bit and 16-bit microprocessors.
- •Three independently programmed analog outputs.
- •Two 8-bit general purpose I/O ports (AY-3-8910).
- •Single +5 Volt supply.

This Programmable Sound Generator (from now on, known as the PSG) is a LSI Circuit which can produce a wide variety of complex sounds under software control. Its flexibility makes it useful in applications such as music synthesis, sound effects generation tone signalling and even FSK modems (with a little extra circuitry). All of these sounds can be produced with just a few simple *POKEs*, leaving the processor free to do other tasks like calculating more sounds, updating the screen or doing graphic anamation (in the case of arcade type games). One or two pokes can produce sounds that carry on for several seconds, or even continuously.

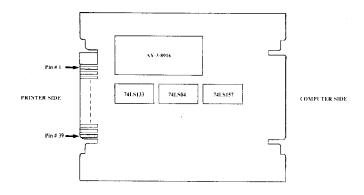
This PSG is a register-oriented device. This means that communication between the processor and the PSG is based on the concept of memory-mapped I/O. The control commands are issued to the PSG by writing (POKEs or STAs) to two memory locations. The first location (memory mapped at hex address FF65) is to select which internal register you wish to access. The second memory location is for the data you wish to enter or retrieve and is at hex address FF64. All functions of the PSG are controlled through 16 registers which once programmed, generate and sustan sounds on its own. More on how to program it later.

Refer to List #1 to get all the parts needed for this project. It is not hard to put together, but like any electronic project, care should be taken when working with static sensitive IC's.

Quantity	Part #	Desc
1	AY-3-8910	PSG
1	74LS133	TTL
1	74LS04	TTL
1	74LS157	TTL
2	16 PIN	SOCKET
1	14 PIN	SOCKET
l	40 PIN	SOCKET
2	.01 UF	CAPACITORS
1	10K OHMS	RESISTOR
1	PROJECT BOARD	RS # 276-163

LIST#1

With the schematic (Diagram 1) in one hand and a soldering iron in the other, it's time to put the board together. Start by getting the ground and B-Plus buses wired in. It is best to wire all the connections to the connector on the side of the board that has the lowest number. That's the side with the number one on the edge. The two buses run close to the edge connector, it will be easier to connect to. Refer to Diagram 2 for the proper layout of the sockets. The rest of the soldering is quite straightforward. Follow the schematic and cross off each line after it's done. This will eliminate any missed wires. When you are finished, clean the board in the usual manner. Check again the wiring with the schematic, remember that the Y'er is not buffered and is not forgiving of wiring errors. A short can cause many headaches. When you're finished, insert the chips (remember pin 1's) and plug it in. Turn the



(Tony DiStefano is well known as an early specialist in Color Computer hardware projects. He is one of the acknowledged experts on the "insides" of CoCo.)



PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100 PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.

1 WITH UTILITIES



If you have a disk drive, you know how important it is to back up your disks. Virtually every book on computers tells you to back everything up, and many recommend at least two backups. That is simply good computer practice. However, the BACKUP command on the color computer will only handle disks with a standard format, so many disks could not be backed up.

Enter **OMNI CLONE**. This amazing program handles most any non-standard disk with ease. It handles variable sector lengths, non-standard sector and track addresses, deleted address marks, forced CRC errors, un-formated tracks, any amount of sectors, any number of tracks (up to 80), and single or double density. **OMNI CLONE** is 100% machine language, and it is completely self-contained. It has its own disk drivers and keyboard scan. It uses no ROM calls at all.

Unlike many programs of this type, you don't need to know anything about the disk you want to clone. **OMNI CLONE** does it all for you, including the formating of the destination disk, and it's all automatic. Don't ever be caught without a backup again! We can't promise that **OMNI CLONE** will back up any color computer disk, but we haven't found any yet that it can't handle. It has even backed up some Model III disks!! **OMNI CLONE** can be used with either one or two drives and requires 32K to run. \$39.95

Programs are available on AMDEK cartridges - add \$5.00 to the disk price.

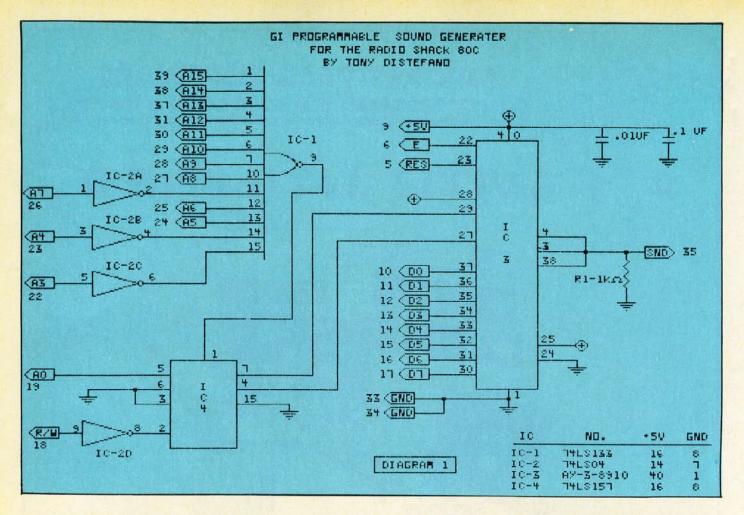
Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

Stocked by Quality Dealers, or Send Order To: PRICKLY-PEAR SOFTWARE



9234 E. 30th Street Tucson, Arizona 85710 (602) 886-1505





computer on, when you get the familiar sign on, turn up the sound, type in and RUN this program.

10 AUDIO ON

20 POKE \$HFF01.\$HB4

30 POKE &HFF03,&H3F

40 SR = & HFF 65 : WD = & HFF 64

50 POKE SR,RND(15)-1 : POKE WD,RND(256)-1 : GOTO 50

This short program will generate ramdom sounds, beeps, pops, and whistles in the speaker of your TV. This is more or less just a test to make sure that the circuit is working. (You will have to use your imagination to come up with better software.) If you do not get any sound, check the wiring again; this circuit does work. I have a working model right here in front of me. Here, just put your ear a little closer and listen. Can you hear it? I told you it works. Okay, enough foolin' around, the following descriptions of the PSG are excerpts taken from the GI product description manual.

Sound Generating Blocks

The basic blocks in the PSG which produce the programmed sounds include:

Tone Produce the basic square wave tone frequencies

Generators for each channel (A, B, C)
Noise Produces a frequency modula

Noise Produces a frequency modulated pseudo ran-Generator dom pulse width square wave output.

Mixers Combine the outputs of the Tone Generators and the Noise Generator. One for each

channel (A, B, C).

Amplitude Provides the D/A Converters with either a fixed or variable amplitude pattern. The fixed amplitude is under direct CPU control;

the variable amplitude is accomplished by using the output of the Envelope Generator.

Generator

Produces an envelope pattern which can be used to amplitude modulate the output of each Mixer.

D/A The three D/A Converters each produce up to a Converters

16 level output signal as determined by the Amplitude Control.

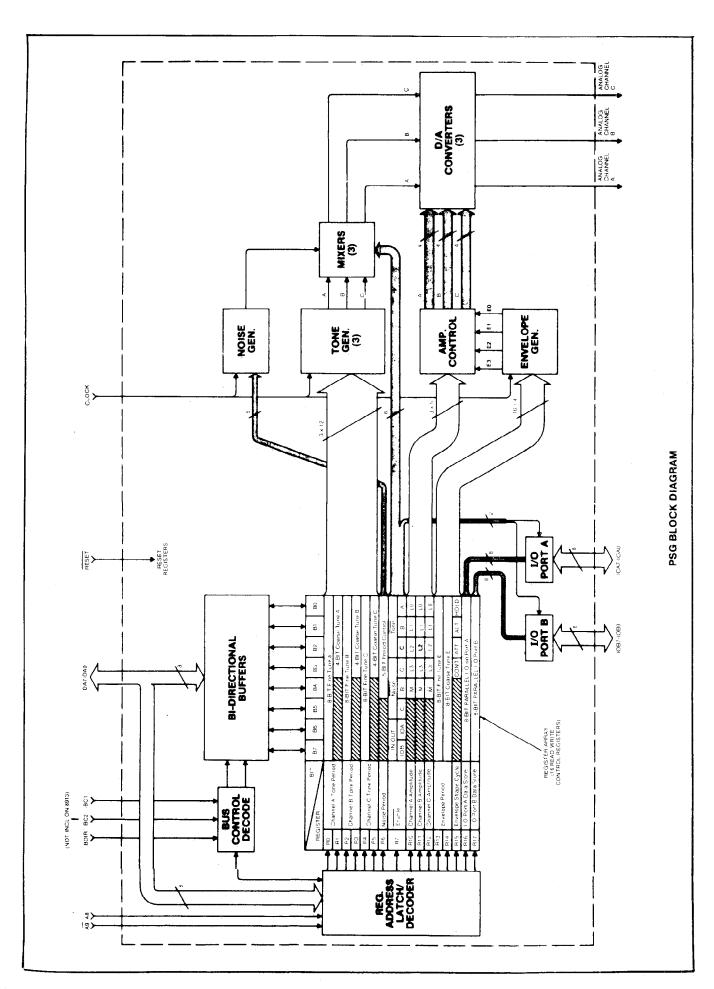
Operation

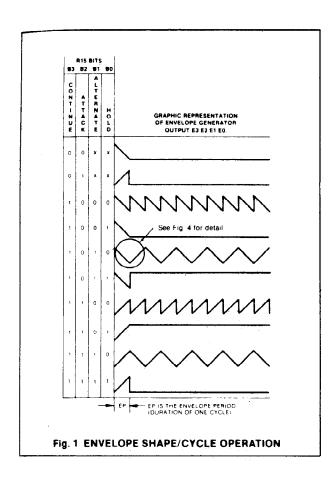
Since all functions of the PSG are controlled by the processor via a series of register loads, a detailed description of the PSG operation can best be accomplished by relating each PSG function to the control of its corresponding register. The function of creating or programming a specific sound or sound effect logically follows the control sequence listed:

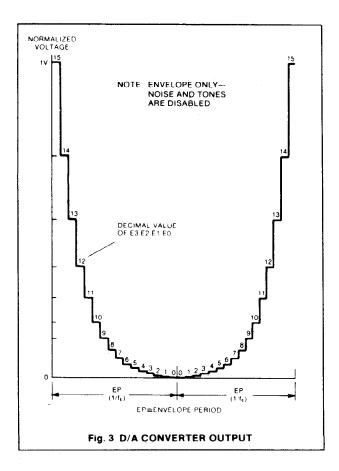
Operation	Registers	Function
Tone Generator Control	R0-R5	Program tone periods.
Noise Generator Control	R6	Program noise period.
Mixer Control	R7	Enable tone and/or noise on selected channels.
Amplitude Control	R10-R12	Select "fixed" or "envelope- variable" amplitudes.
Envelope Generator		
Control	R13-R15	Program envelope period and select envelope pattern

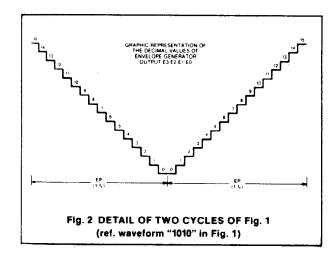
Tone Generator Control (Registers R10, R1, R2, R3, R4, R5)

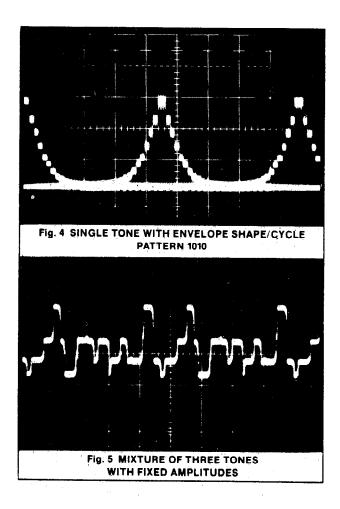
The frequency of each square wave generated by the three Tone Generators (one each for Channels A, B, and C) is











obtained in the PSG by first counting down the input clock by 16, then by further counting down the result by the programmed 12-bit Tone Period value. Each 12-bit value is obtained in the PSG by combining the contents of the relative Coarse and Fine Tune registers, as illustrated in the following:

THE PROGRAM STORE

Guarantee: We will ship your order for items in this ad within 48 working hours or you get 20% OFF! (Books/non-released items excluded. Gift certificate issued when shipped. Offer expires September 10, 1983)



PROTECTOR

You have 4 ships armed with laser cannon and smart bombs. They have waves of enemy fighters; their mother ships have laser and heat-seeking mines. Get a new ship for each 5,000 points you score. Exciting arcade action with hi-res 4-color graphics

41331 32K Tape \$24.95 \$21.21 Now 15% off til Sept 10



by Dave Hooper and Mark Barnes Fantastic graphics oriented Hi-Res flight simulator has 2 speeds, 4 difficulty levels, views from top and side, instrument panel and realistic joystick control. Don't crash or have to "go around!" Can you land on the runway to hear the synthesized voice say "perfect landing"

33556 32K Extended Basic \$19.95



/IKING

from Prickly Pear

Superb simulation game! Rise through the ranks of a Viking kingdom, increase your economic power and rank until you win the game by becoming ruler of all. 1 to 4 players can complete it in 2 to 4 hours 35109 16K

Extended Tape \$19.95

FROGGER

from CornSoft

One of the most popular arcade games ever available for your Color Computer! Just as in the arcade game, you must dodge heavy traffic and jump the moving logs in the stream to get home. Fantastic graphics. One or two players, use keyboard or joystick.

22947 16K Tape \$19.95

COLOR from Soft Sector Marketing

This is the fast-action arcade game you've been waiting to play at home! You must hit mushrooms and caterpillars segment by segment — moths and tumble bugs. The challenges: they are all moving, when hit they split into additional segments or metamorphose into different shapes; when you destroy a caterpillar, the new one that replaces it is a segment longer than the original!

36728 16K Tape \$19.95 \$16.96 Now 15% off til Sept 10



from Spectral Associates

Use your joystick to guide Ms. Gobbler through 4 mazes on a black background with moving shapes to gobble. Avoid ghosts of different colors and personalities. Zip through the teleportation spot and use inviso-maze to make the walls disappear

32500 32K Tape \$21.95 WHIRLYBIRD

from Spectral Associates

Pilot a chopper over varying terrain while destroying enemy bases with bombs and missiles. Destroy enemy fuel depots and win their fuel. Hi Res color graphics, machine language arcade game has three screens. Requires joysticks

32511 16K Tape \$21.95

DOLLARS AND SENSE

from Spectral Associates

Smarten' up! What's more important than learning about money? This new educational game will teach your child about dollars and coins. Easily reinforces coin recognition and value. Let the kids count the channel

27751 16K Extended Basic Tape \$11.95

MASTER CONTROL II

from Soft Sector Marketina

This is a BASIC language program designed to decrease typing time and error while providing direct control of motor, trace, audio and run. With Automatic Line Numbering and a custom key you can re-use or change at any time; plus 50 preprogrammed command keys. Can be used on a 32K system.

21340 16K/32K Tape \$24.95 \$21.21 Now 15% off til Sept 10

RAINBOW-WRITER SCREEN FORMATTER

by Rainbow Connection Software

The ultimate hi-res graphics text display. User definable 224 character set, 12 sizes in a multitude of colors with many screen features, including status/help screen. Works in all PMODES - save characters, symbols, and animated figures to use in your own BASIC or ML programs. Easily create dazzling displays - the possible uses are almost unlimited!

33455 16K Extended Basic Tape \$29.95 32757 Disk \$32.95

COLOR COMPUTERS NEWS **1981 BACK ISSUES**

This is the complete collection of articles appearing in the first 4 issues of Color Computer News (May to December of 81) 17 different topics are covered plus continuing features like "ReMarks", Kids Page and New Products.

43209 Softcover \$9.95 While they last —quantities limited.



Over 2500 Programs for TRS-80, ATARI 400/800, APPLE, IBM & VIC 20.

Visit our other stores:

829 Bethel Rd., Columbus, Ohio Seven Corners Center, Falls Church, VA W. Bell Plaza, 6600 Security Blvd., Baltimore, MD White Flint Mall, Rockville Pike, Rockville, MD Harvard Square, 13 Dunster St., Cambridge, MA

Opening Soon in Tulsa and Oklahoma City

Westmoreland Mall, Rte. 30 East, Greensburg, PA Plymouth Meeting Mall, 500 Germantown Pike, Plymouth Meeting, PA Cherry Hill Mall, Rte. 38 & Haddonfield Rd., Cherry Hill, NJ Nanuet Mall, Rte. 59 & Middletown Road, Nanuet, NY Monmouth Mall, Rte. 35 & Wyckoff Road, Eatontown, NJ

FRANCHISE OPENINGS IN SELECTED CITIES

© 1983 THE PROGRAM STORE

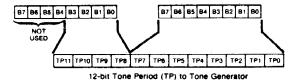
To Order Call Toll Free 800-424-2738 For Information Call (703) 556-9778

Send check or M.O. for total purchase plus \$2.00 shipping and handling. VA add 4% sales tax. Charge cards - include all embossed information



THE PROGRAM	STORE • Dept. 2	4-09	-3 • Box 9582 • 420	0 Wisconsin Avenue, NW 🔹 🛚	Washington, D.C. 20016
ltem # Title	Tape/Disk/Rom/Book			Name	
			Total	Address	
			☐ CHECK ☐ VISA	CityStat	eZip
¦ ————				Card #	Ехр
			Computer For TRS-80 C	olor Computer	
					

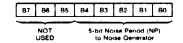
Coarse Tune		Fine Tune		
Register	Channel	Register		
Ř1	Α	R0		
R3	В	R2		
R5	C	R4		



Noise Generator Control (Register R6)

The frequency of the noise source is obtained in the PSG by first cutting down the input clock by 16, then by further counting down the result by the programmed 5-bit Noise Period value. This 5-bit value consists of the lower 5 bits (B4-B0) of register R6, as illustrated in the following:

Noise Period Register R6



Mixer Control—I/O Enable (Register R7)

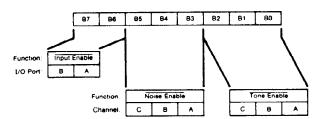
Register R7 is a multi-function Enable register which controls the three Noise/Tone Mixers and the two general purpose I/O Ports.

The Mixers, as previously described, combine the noise and tone frequencies for each of the three channels. The determination of combining neither/either/both noise and tone frequencies on each channel is made by the state of bits B5-B0 or R7.

The direction (input or output) of the two general purpose I/O Ports (IOA and IOB) is determined by the state of bits B7 and B6 of R7.

These functions are illustrated in the following:

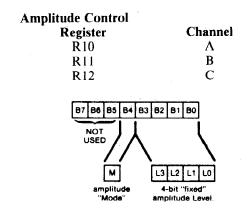
Mixer Control—I/O Enable Register R7



Amplitude Control (Registers R10, R11, R12)

The amplitudes of the signals generated by each of the three D/A Converters (one each for Channels A, B, and C)

is determined by the contents of the lower 5 bits (B4-B0) of registers R10, R11, and R12 as illustrated in the following:

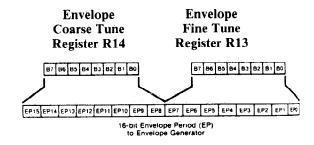


Envelope Generator Control (Registers R13, R14, R15)

To accomplish the generation of fairly complex envelope patterns, two independent methods of control are provided in the PSG: first, it is possible to vary the frequency of the envelope using registers R13 and R14; and second, the relative shape and cycle pattern of the envelope can be varied using register R15. The following paragraphs explain the details of the envelope control functions, describing first the envelope period control and then the envelope shape/cycle control.

Envelope Period Control Registers R13, R14)

The frequency of the envelope is obtained in the PSG by first counting down the input clock by 256, then by further counting down the result by the programmed 16-bit Envelope Period value. This 16-bit value is obtained in the PSG by combining the contents of the Envelope Coarse and Fine Tune registers, as illustrated in the following:



Envelope Shape/Cycle Control (Register R15)

The Envelope Generator further counts down the envelope frequency by 16, producing a 16-state per cycle envelope pattern as defined by its 4-bit counter output, E3 E2 E1 E0. The particular shape and cycle pattern of any desired envelope is accomplished by controlling the count pattern (count up/count down) of the 4-bit counter and by defining a single-cycle or repeat-cycle patern.

This envelope shape/cycle control is contained in the lower 4 bit (B3-B0) of register R15. Each of these 4 bits

CC SOFTWARE

UNIVERSAL PROGRAM 1(UP-1) *

* Known as the Program Stacker, UP-1 allows * several programs to be loaded until the memory is * filled. Quickly jump from one program to another * or compose new programs while retaining the old * ones. Data or ML programs can be stored and re- * trieved from a cassette. Characters or values can * be written to memory and memory contents can be * examined. Text can be composed and stored in memory and printed on an external printer. * UP-1 Cassette \$14.95

* DISASSEMBLER-ASSEMBLER (DISASM) *

* Using English mnemonics and Decimal Locations, * DISASM is an easy way to learn to assemble machine * Language Programs or Subroutines. Subroutines can * be used with Basic Programs and called by either * USR or EXEC commands. For CC compatibility, all * locations are given in Decimal eliminating the * confusion associated with HEX. All commands are * Menue oriented for easy entry. The Disassembler * can be used to Analyze Machine Language Programs * as well as the Basic and Extended CC ROMS. Example * programs are included. Cassette \$19.95

* TERMINAL PROGRAM (DYTERM)

DYTERM converts a CC into a terminal. Receive and send data between 2 computers, another terminal or a MODEM. BASIC Program with ML subroutines.

DYTERM Cassette \$14.95

* FINANCE PROGRAM (DYFIN) * new

* DYFIN is designed to aid in the financial planning * of loans, savings, annuties, investments & retire-* ments. It quickly calculates monthly payments for * loans and gives the return for money invested over * a period of years. Also included is a 500 year * Calender that displays any month of any year plus * a checkbook program. EB is required. Tape \$19.95

EXTENDED BASIC not REQUIRED unless noted. Programs require a 16K Computer and are DISK compatibile.

HARDWARE ITEMS

Increase your computer's memory with the following **
Memory Expansion Kits. Soldering is not required **
and the modifications are reversible. Each kit is **
warranted for one year. **

ME. 1	\$19.95
ME-1 upgrades 4K to 16K	
ME-2 upgrades 4K to 32K	\$59.95
ME-3 upgrades 16K to 32K	\$39.95
ME-4 upgrades D & E CC to 64K	\$99.95
ME-4F upgrades F series to 64K	\$89.95
Note: ME-4 & ME-4F require a 1.1 RDM.	WE WILL
install our kits in your Computer for 9	\$10 + ship.

6809E Microprocessor Chip	\$19.95
6821 Peripheral Interface Adapter	\$6.95
EXTENDED BASIC ROM	\$87.00

WE REPAIR COMPUTERS

* PUT YOUR PROGRAMS IN A PROM PACK *

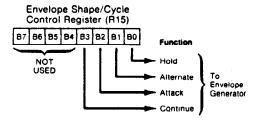
Send us your program on a cassette and we will send you a cartridge with your program in it. Send \$19.95 for 4K and \$29.95 for 8K.

Blank cartridge with circuit board \$9.95 EPROM type 2764 \$9.95

NEW & USED RS & TDP COLOR COMPUTERS were purchased and upgraded for use in our Computer School. Call or write for prices. All carry a 180 day warranty.

checks, VISA & MC Cards. Add \$2 ship.

DYNAMIC ELECTRONICS INC Box 896 (205) 773-2758 HARTSELLE, AL 35640 controls a function on the envelope generator, as illustrated in the following:



D/A Converter Operation

Since the primary use of the PSG is to produce sound for the highly imperfect amplitude detection mechanism of the human ear, the D/A conversion is performed in logarithmic steps with a normalized voltage range of from 1 to 1 Volt. The specific amplitude control of each of the three D/A Converters is accomplished by the three sets of 4-bit outputs of the Amplitude Control block, while the Mixer outputs provide the base signal frequency (Noise and/or Tone).

(Reprinted by permission, courtesy General Instruments/Microelectronics)



FEATURES:

- Absolutely no changes to your CoCo
- Circuitry contained in ROM-port cartridge
- •ON-OFF switch on cartridge, with LED indicator
- Over two hours support time during power failures
- •External battery connected via cable
- Battery charging from CoCo power supply
- •Plug-and-Play installation
- Optional ribbon cable bus extender
- (* + 5v-only memory)

Master Card or Visa Welcome call 803-356-2398 or send checks or MO's to:

ONLY \$89. includes rechargeable battery (\$99. w/bus extender option) S.C. residents add 4% tax

SAV-A-BYTE

2857 Emanuel Church Rd. W. Columbia, S.C. 29169

90 Day Warranty 10 Day Return Privilege

-Dealer inquiries welcome-

"Second Birthday Issue"

Having trouble getting a copy of Color Computer News at your newsstand?

Let us bring the newsstand to you!

For \$2.95 and the coupon below you can have a chance to chamine the latest copy of Color Computer News. Or, if you have already had a chance to examine Color Computer News and would like to subscribe, fill out the subscription form and you will receive one full year of informative, educational and recreational information.

AMPLE COUPON

Markable Software, Inc P.O. Box 1192 Muskegon, MI 49443

Keffy Seminary Dist.
P.O. Box 11982
Edmonton, Whista T5J 31

The 12 issue subscription rate is:
United States \$27.06.
Canada/Mexico \$38.00

De La La Carta de La Carta de

close \$2.95 and send to:

RÊMarkable Softward P.O. Box 1192 Muskegon, MI 49443

Allow 8-10 weeks for delivery

isa/Mastercard /

Expiration Date

Subscription begins with next available issue

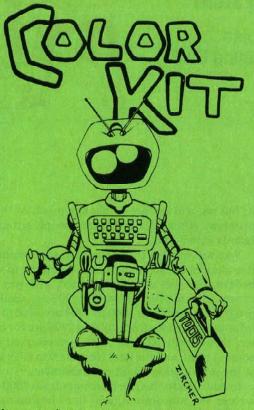


PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.

1 WITH UTILITIES



COLORKIT

We are proud to announce that the COLORKIT, written by George Zinowitz, and formerly marketed by Arizin Inc. of Scottsdale, Az., is now one of the broad line of Prickly-Pear Software utilities.

This programer's aid is truly an amazing program. First the small stuff. With the COLORKIT you have your choice of light or dark screen, and you can have a keyclick if you like. You can easily disable the BREAK key also, and you can slow your listings down to a readable speed.

In addition, you get an outstanding FULL SCREEN EDITOR while retaining the standard editor. You can list all the variables currently being used in a program. You can merge machine language programs and BASIC programs into a single unit that can be saved or loaded easily. You can do a global search through your program for any target you specify. You

can easily examine or move sections of memory. You can echo all screen output to the printer. You can easily recover a program lost because of a NEW, BACKUP, or DSKINI command. You can print the addresses of the last machine language program cloaded. You can get a help file on the screen showing all commands. You can program 10 function keys with up to 250 keystrokes each.

Whew!! We're running out of breath, but you can believe we are not running out of features! The incredible thing is that all of these functions are easy to use. They are accessed by simple one word commands. What the program really does is add a lot of commands to BASIC that should be there but aren't. Did you type NEW by mistake? No problem —just type .OLD and the program is back! The other features are just as easy to use. The program comes with a 20 page manual which fully explains all of the features.

This program is about 6K long and is 100% machine language and 100% relocatable. It runs in computers 16K or larger. If you have 64K you can put it up high, and it uses no BASIC space at all. The same program will work equally well on disk or non-disk machines. Step up to the program that REALLY extends your BASIC, and take full advantage of all the great programer's tools you've been missing. On tape — \$34.95. Same program on disk — \$39.95.

Programs are available on AMDEK cartridges - add \$5.00 to the disk price.

Your personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

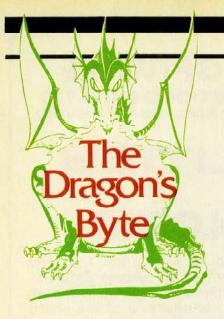
Stocked by Quality Dealers, or

Send Order To: PRICKLY-PEAR SOFTWARE



9234 E. 30th Street Tucson, Arizona 85710 (602) 886-1505





Blow By Blow Account Of An Emerging Combat System

By Bill Nolan
Rainbow Contributing Editor



16K

elcome to the Dragon's Byte. As most of you know, this is a column about using your computer to aid you in the playing of fantasy role-playing games. Every few months I repeat the following information, so if you missed it, here's your chance. Fantasy role-playing games—such as Dungeons and Dragons, Runequest, Tunnels and Trolls, or Worlds of Wonder—are not computer games. They are also not board games. What they are is a separate type of game in which the players each try to assume the personality of a made up character and act out their part in some sort of adventure.

Just as the term "fantasy role-playing game" implies, participants are playing a role in some sort of fantasy. Children (we were all children) play simple versions of these games and call them "cops and robbers" or "cowboys and Indians." The adult versions are the same in concept, but are far more complex. The rule books all appear to have been written by former legislators, and make about as much sense as the tax laws. In this column we strive together to get help from our computers as we play our favorite fantasy game.

The programs here are not games. They are programs designed to simplify and speed up some of the more tedious parts of playing these very enjoyable games.

Enough of that. For the last two months, we have been working on a computerized combat system. In doing this we have examined some ways to make the not very random RND unpredictable, and we have looked at the reasons for putting a combat system on the computer. We have also determined the major things we want the system to do for us. If you missed this column in July or August, you will want to get those issues and read them, because a lot of the background for what we are doing this month was presented there.

Included this month you will find a program. This is not the whole combat system quite yet, but the program works fine as is. In future columns we will be adding some things to

(Bill Nolan is a principal in Prickly-Pear Software, DM's a weekly game of Dungeons & Dragons, and teaches Programming In BASIC at a local college.)

it, but we will try not to change much of this foundation program. After all, I don't want people sitting at their keyboards cursing me.

You will see that the program has five main sections, and five choices on the main menu. Contrary to what you may believe, this was actually planned, and was not a coincidence. Line numbers from 0 to 999 are used to set up the program. Lines from 1000 to 1999 are used to save and load information, those from 2000 to 2999 are for editing character, those from 3000 to 5999 are reserved to handle the combat itself, and the lines from 6000 to 6999 are for looking at the information about each character.

In addition to this, we have lines from 7000 to 7999 which we use for subroutines, and lines beginning at 10000 for *DATA* statements. In many cases, as you can see below, we don't need all those line numbers, but starting each section on an even program also keeps track of the current hit points of each fighter and tells you when someone is down. When one side of a combat is down, it skips over that one in the future. The program tells you what round you are in, and after every round it gives you the option of breaking off the combat.

Lines 3000 to 3050 find out how many combats there will be, who is involved in each, what weapon they are using, and whether it has any magical plusses. In line 3050, the round counter "RC" is set to 1.

The combat loop starts in line 3060, and the values needed to hit are figured in lines 3085 and 3090. This is figured like this: (base chance) - (level - 1) - (class bonus) - (weapon plus) - (strength bonus) + or - (magical adjustment) + (10 - opponent's armor class) + (opponent's speed bonus) + ((opponent's level - 6) + opponent's class adjustment) - ((fighter's level - 6) + fighter's class adjustment). See, nothing to it!

Once it ("it" is the computer) knows the numbers needed to hit, it either rolls the dice or has you input the results. This is done in lines 3120 to 3160. In line 3170, the program figures the initiative. This is based on the difference between the number needed to hit and the actual roll, so if I need a 10, but roll a 20, and you need a 4, but roll a 15, then you have initiative, because your difference is greater.

Lines 3200 to 3410 compute the results of that combat round, and line 4000 recycles the whole thing. Keep in mind that in doing their jobs these line numbers call out to subroutines from time to time. These subroutines are located in lines 7000 to 7500, and I will cover each of them in a moment.

Lines 6000 to 6100 simply print out each combatant stored in the file one after the other.

Line 7000 gets a single number from the keyboard within the range of 1 to XX, with XX being set in the line that calls the routine. It also helps out the random a bit, and then returns the number in the variable K.

Line 7010 just waits for any key to be pressed and then returns, as in "PRESS ANY KEY TO CONTINUE."

Line 7100 gets "Y" for yes or "N" for no from the keyboard and then returns.

Line 7200 prints an error message if you try to hold a combat and have less than two combatants available. Remember, it takes two to make a fight.

Line 7300 gets the weapon damage multiplier for those natural combatants using natural weapons like teeth, claws, or tails. Your best bet here is to look at line 10010, which has the weapon data. The number following each weapon is its multiplier, so if you know what the natural attack can do as compared to some number, it is much easier to keep track of where everything is located. It is more than a little embarassing to get lost in your own program.

What we are going to do this month is go through the program section by section, so you can see what is done where. That way, if you don't like something, you'll know where to go to change it. Fantasy games are very personal, and the size of the original rules is exceeded only by the size of the changes made by the average group of players.

The first part is pretty standard. Lines 10—17 set up the arrays and read some DATA into them. As you can see, we are using several one and two dimension arrays, and one array of three dimensions. Line 20 prints the menu of choices, line 30 gets your choice, and line 40 branches to the section you have chosen. The block of lines from 100 to 270 asks you to input all of the necessary information about a potential combatant. This could be either a character or a monster, and when you have input the information, the program returns you to the menu. The variable CC (Control Counter) is used to keep track of how many combatants are in the file, and that array—M\$—is dimensioned to hold 31. We are keeping track of name, class, combat adjustment. level, strength adjustment, speed adjustment, number of attacks, base hit points, current hit points, magical adjustments (not including weapon adjustments, which are handled elsewhere), and armor class. By the way, the program does not trap out multiple uses of the same name. Since the searches are by name, and since they stop searching as soon as they find the target name, you must be careful not to use the same name twice.

The area from 1000 to 1130 is used to save or load data. It is currently set up for disk, and if you are using tape, you will have to make some changes. To start with, you will have to change every "#1" to be "#-1," because the disk is device 1, while the tape is device -1. Also, you will have to change the WRITE in lines 1055 and 1070 to PRINT. After you have input all of your characters and monsters, you should save them to disk or tape before continuing. Be sure you have a disk in the drive or a tape in the recorder with play and record pressed before trying to save, or you may lose your data. If you ever bomb out of the program, you can usually

recover your data by immediately typing GOTO 20 and ENTER. This should put you back into the menu.

As we said above, lines 2000 to 2140 are used to change a single data item about a character or monster. If you want the change to be permanent, you will have to save your file again.

That brings us to line 3000, and a sudden increase in complexity. The program will handle nine combats at the same time, with two participants in each. The same combatant can be involved in more than one of these combats. The program figures the number needed to hit, the initiative, and the damage. It gives you the option of letting it roll the dice or having you roll them and enter the values. This is important, as many gamers (mysclf included) like to roll the dice themselves. The weapon, you can easily figure out a suitable multiplier. For example, a two-handed sword has a multiplier of 1.5, so if you think a particular dragon's bite (byte?) is twice as bad as the sword, give it a multiplier of three. If you don't like the damage you are getting, change all the multipliers.

Lines 7400 and 7410 roll the combat dice if you select that option.

Line 7500 checks to see if you want to break off the combat. Notice that this subroutine calls to the subroutine in line 7100.

The subroutine at 7600 is used to run a check when one of the combatants is down. Since the combatant may be involved in more than one meelee, the program checks to see if there are any others involving this name. If any are found, a "0" is inserted in the array "F" at that number. A "1" in array "F" indicates a fight in progress.

Well, I guess that about covers the program on a line by line basis. The actual use of the program is pretty simple. Once you have typed it in and have all those nasty typos corrected, RUN the program. The first thing you will see is the menu, and your first selection should be "ADD A COMBATANT." You can't use any of the other options until you have put at least a couple of combatants into the file, so get out a couple of your favorite character sheets and type in the information as the program asks for it.

Once you have your characters and monsters in the file, save the file to tape or disk. If you don't do this, you'll be sorry.

Now you can examine your file, edit a particular combatant, or try out a combat. I think you will find the program to be pretty much self-prompting, and wherever possible, I have tried to trap out bad inputs.

Next month we will be working on some expansions and improvements to this program. We will surely add fumble and critical hit tables, and I have some other ideas I think you'll like as well. In the meantime, if you have suggestions or comments, let me know. If you find any bugs (heaven forbid!), immediately swear your most sincere vow of secrecy and call me so I can fix it.

3030 ___086E 3092 ___0BBB 3300 ___103B 6100 ___13A3 g: END ___1713

The listing:

10 CLS:X=RND(-TIMER):DIMM\$(30,10),W\$(13,1),C\$(10),CI\$(9,2,3),F(9),WP(9,2)

140_

024E

1060 ___051B

15 FOR X=Ø TO 10:READ C\$(X):NEXT X

17 FOR X=1 TO 13:READ W\$(X,Ø):RE ADW\$(X,1):NEXT X

20 CLS:PRINT@46, "MENU"; :PRINT@10 2, "1. ADD A COMBATANT"; :PRINT@16 6, "2. SAVE OR LOAD DATA"; :PRINT@ 230, "3. EDIT A COMBATANT"; :PRINT@ 294, "4. COMBAT SECTION"; :PRINT@ 358, "5. EXAMINE COMBATANTS"; :PRINT@ NT@422, "YOUR CHOICE? (1-5)"; :K\$= INKEY\$

3Ø XX=5:GOSUB 7ØØØ

40 ON K GOTO 100,1000,2000,3000,

100 CLS:PRINT@34,"";:INPUT"COMBA TANT'S NAME";X\$

120 CLS:PRINT:PRINT" 1. FIGHTER"
:PRINT" 2. THIEF":PRINT" 3. CLER
IC":PRINT" 4. MAGICIAN":PRINT:PR
INT:PRINT" KEY YOUR CHOICE (1-4)
":K\$=INKEY\$

130 XX=4:GOSUB 7000

135 M\$(CC,Ø)=X\$

14Ø ON K GOSUB 15Ø,16Ø,17Ø,18Ø:G OTO2ØØ

150 M\$(CC,1)="FIGHTER":M\$(CC,2)=
"6":RETURN

16Ø M\$(CC,1)="THIEF":M\$(CC,2)="3



1210 E. Colonial Drive • Orlando, Florida 32803

IFD-COCO DISC SYSTEM-\$439.

DISK DRIVES \$260

POWER SUPPLY & CASE

64K RAM \$59.95

One Drive Disk cable \$19.95 Two Drive Disk cable \$29.95

Shipping and Handling Extra

Voice: 305-894-1887

Data: 305-894-1886



No C.O.D.'s Please Cashiers Check or M.O ": RETURN 170 M\$(CC,1)="CLERIC":M\$(CC,2)=" 2":RETURN 180 M\$(CC,1)="MAGICIAN":M\$(CC,2) ="Ø":RETURN 200 CLS:PRINT@34,C\$(3);:INPUT M\$ 21Ø CLS:PRINT@34,C\$(4);:INPUT M\$ (CC, 4) 22Ø CLS:PRINT@34,C\$(5);:INPUT M\$ (CC, 5) 23Ø CLS:PRINT@34,C\$(6);:INPUT M\$ (CC, 6) 24Ø CLS:PRINT@34,C\$(7);:INPUT M\$ (CC, 7):M\$(CC, 8)=M\$(CC, 7)250 CLS:PRINT@34,C\$(9);:INPUT M\$ 260 CLS:PRINT@34,C\$(10);:INPUT M \$(CC, 10) 27Ø CC=CC+1:GOTO 2Ø 1000 CLS:PRINT:PRINT" DO YOU WAN T TO SAVE OR LOAD?":PRINT:PRINT" PRESS 'S' OR 'L'.":K\$=INKEY\$ 1010 J\$=INKEY\$:IF J\$<>"S" AND J\$ <>"L" THEN 1010 ELSE SOUND 150.1 1020 IF J="L" THEN PRINT:PRINT" LOADING WILL ERASE CURRENT":PRI NT" MEMORY. ARE YOU SURE (Y/N)" :K\$=INKEY\$:ELSE GOTO 1040 1030 K\$=INKEY\$:GOSUB 7100:IF K\$= "N" THEN 2Ø 1040 IF J\$="L" THEN1100 1050 OPEN"O",#1,"COMBAT" 1055 WRITE #1,CC 1060 FOR X=0 TO 20:FOR Y=0 TO 10 1Ø7Ø WRITE #1,M\$(X,Y) 1080 NEXT Y, X:CLOSE 1:GOTO20 1100 OPEN"I", #1, "COMBAT" 1105 INPUT #1,CC 1110 FOR X=0 TO 20:FOR Y=0 TO 10 112Ø INPUT #1.M\$(X.Y) 1130 NEXTY, X:CLOSE 1:GOTO 20 2000 IF CC=0 THEN GOTO 6100 ELSE CLS:PRINT:PRINT" EDIT WHAT COMB ATANT": PRINT" ":: INPUT S\$ 2010 FOR X=0 TO CC-1: IF S\$=M\$(X, Ø) THEN 2100 ELSE NEXT X 2020 CLS:PRINT"FILE NOT FOUND":F OR X=1 TO 1000:NEXT X:GOTO 20 2100 CLS:FOR Y=0 TO 10:PRINT STR \$(Y) \$ " \$C\$(Y) \$ " \$ " \$M\$(X,Y) \$NEXT Y 2110 PRINT: PRINT" INPUT THE NUMBE R TO EDIT": PRINT 2120 INPUT Z:IF Z<Ø OR Z>10 THEN

2120 ELSE SOUND 150,1

2130 CLS:PRINT"COMBATANT = ";M\$(

214Ø PRINT:PRINT" YOU ARE CHANGI NG":PRINT" ";C\$(Z):PRINT:PRINT"

ENTER NEW INFORMATION": INPUT" "; M\$(X,Z):60TO 20 3000 CLS:IF CC<2 THEN GOTO 7200 ELSE PRINT: PRINT" HOW MANY COMBA (1-9)":K\$=INKEY\$:XX=9:GOSUB 7000:NC=K:FOR XJ=1 TO 9:F(XJ)=0 :NEXT:FOR XJ=1 TO NC:F(XJ)=1:NEX 3010 FOR X=1 TO NC:FOR Y=1 TO 2 3020 CLS:PRINT:PRINT" COMBAT #"; X:PRINT:PRINT" WHO IS COMBATANT #";Y:INPUT" ";X\$ 3Ø3Ø FOR Z=Ø TO CC-1:IF X\$=M\$(Z, Ø) THEN CI\$(X,Y,Ø)=X\$:CI\$(X,Y,3) =STR\$(Z):ELSE NEXT Z:PRINT"NAME NOT FOUND":FOR XJ=1 TO 1000:NEXT XJ:GOTO 3020 3040 CLS:PRINT X\$:PRINT:FOR Z=1 TO 13:PRINT STR\$(Z);". ";₩\$(Z,Ø) :NEXT Z:INPUT" CHOOSE WEAPON (1-13)";WT:IF WT<1 OR WT>13 THEN 3Ø 40 ELSE CI\$(X,Y,1)=W\$(WT,0):CI\$(X, Y, 2) = W\$ (WT, 1): IF WT=13 THEN GO SUB 7300 3045 CLS:PRINT:PRINT"ENTER WEAPO N'S PLUS TO HIT":INPUT" ";WP(X,Y 3050 NEXT Y, X:RC=1 3Ø6Ø FOR X=1 TO NC:CLS:IF F(X)=Ø THEN NEXT X:GOTO 20 3070 PRINT"COMBAT #"; X; " ROUND #";RC:PRINT"# 1 COMBATANT IS "; CI\$(X,1,0):PRINT"# 2 COMBATANT I S ";CI\$(X,2,Ø) 3080 X1=VAL(CI\$(X,1,3)):X2=VAL(C I\$(X,2,3)) 3Ø85 H1=22-(VAL(M\$(X1,3))-1)-(VA L(M\$(X1,2))-WP(X,1)-(VAL(M\$(X1,4)))-(VAL(M\$(X1,9)))+(10-(VAL(M\$ (X2, 10))))+(VAL(M\$(X2, 5)))+((VAL (M\$(X2,3))-6)+(VAL(M\$(X2,2)))-((VAL(M\$(X1,3))-6)+(VAL(M\$(X1,2))3Ø87 IF H1<2 THEN H1=2 ELSE IF H 1>30 THEN H1=30 3090 H2=22-(VAL(M\$(X2,3))-1)-(VA L(M\$(X2,2)))-WP(X,2)-(VAL(M\$(X2,4)))-(VAL(M\$(X2,9)))+(10-(VAL(M\$ (X1,10))))+(VAL(M\$(X1,5)))+((VAL (M\$(X1,3))-6)+(VAL(M\$(X1,2)))-((VAL (M\$ (X2,3))-6)+(VAL (M\$ (X2,2)))) 3092 IF H2<2 THEN H2=2 ELSE IF H 2>3Ø THEN H2=3Ø 3100 PRINT" ";CI\$(X,1,0);" NEEDS ";H1;"TO HIT" 3110 PRINT" ";CI\$(X,2,0);" NEEDS ";H2;"TO HIT" 3120 PRINT" WANT ME TO ROLL THE DICE?":K\$=INKEY\$:GOSUB 7100:IF K

\$="Y" THEN 7400 313Ø PRINT" ";CI\$(X,1,Ø);"'S ROL L";: INPUT R1 314Ø PRINT" ";CI\$(X,2,Ø);"'S ROL L";:INPUT R2 3145 R1=R1+1:R2=R2+1:IF (R1-H1)= <Ø AND (R2-H2)=<Ø THEN PRINT" NE ITHER HIT":GOTO 4000 315Ø IF (R1-H1)>Ø THEN PRINT " " ;CI\$(X,1,Ø);" HIT. ":D1=INT((R1-H1) *VAL(CI\$(X,1,2))) 316Ø IF (R2-H2)>Ø THEN PRINT " " ;CI\$(X,2,Ø);" HIT. ":D2=INT((R2-H2) *VAL (CI\$(X,2,2))) 317Ø IF(R1-H1)>(R2-H2) THEN I=1 ELSE IF (R1-H1) < (R2-H2) THEN I=2ELSE I=3 3180 ON I GOTO 3200,3300,3400 3200 PRINT" ";CI\$(X,1,0);" HAS I NITIATIVE":PRINT" ";CI\$(X,1,Ø);" 'S DAMAGE IS"; D1: XJ=VAL (M\$ (VAL (C I\$(X,2,3)),8)):XJ=XJ-D1:M\$(VAL(C I(X,2,3)),8)=STR$(XJ):IF XJ=<\emptyset$ THEN PRINT" "CI\$(X,2,Ø);" IS DOW N":F(X)=Ø:JJ\$=CI\$(X,2,Ø):GOSUB 7 600:GOTO 4000 321Ø IF(R2-H2)>Ø THEN PRINT" ";C I\$(X,2,Ø);"'S DAMAGE IS";D2:XJ=V AL(M\$(VAL(CI\$(X,1,3)),8)):XJ=XJ-

WEN S

ADVANCED MATH PROGRAMS for

ENGINEERS • PHYSICISTS • STUDENTS

FUNCTION GRAPHING MODULE 16K EXT-\$19.95

- * HIGH RESOLUTION GRAPHS
- * GRAPH ANY FUNCTION 4 AT ONCE
- * PARAMETERS EASY TO CHANGE
- * AUTO-SCALING OPTIMIZES GRAPH SIZE
- * FIND AND COMPUTE FUNCTION VALUES & ZEROS
- * INTERSECTION OF FUNCTIONS
- <u> COMPLETE MANUAL PROGRAM ON TAPE</u>

CALCULUS MATH MODULE 32K EXT-\$34.95

- * STARTS WITH THE GRAPHING MODULE
- LOAD UP 9 FUNCTIONS AT ONCE
- * FIND AND COMPUTE MAXIMA & MINIMA
- * NUMERIC INTEGRATION & DIFFERENTIATION
- * COMPOSITE AREAS
- * HANDLES PIECEWISE CONTINUOUS FUNCTIONS
- * HARD COPIES OF DATA AND/OR GRAPH
- * COMPLETE MANUAL PROGRAM ON TAPE

P.O. BOX 401 ST. ANN, MO 63074

CHECK OR MONEY ORDER — \$1.00 for shipping

D2:M\$(VAL(CI\$(X,1,3)),8)=STR\$(XJ):IF XJ=<0 THEN PRINT " ";CI\$(X. 1,Ø);" IS DOWN":F(X)=Ø:JJ\$=CI\$(X ,1,Ø):GOSUB 7600:GOTO 4000 322Ø GOTO 4ØØØ 3300 PRINT" ";CI\$(X,2,0);" HAS I NITIATIVE":PRINT" ";CI\$(X,2,0);" 'S DAMAGE IS"; D2: XJ=VAL(M\$ (VAL(C I\$(X,1,3)),8)):XJ=XJ-D2:M\$(VAL(C I(X,1,3)),8)=STR$(XJ):IF XJ=<\emptyset$ THEN PRINT" "CI\$(X,1,0);" IS DOW $N":F(X)=\emptyset:JJ$ \$=CI\$(X,1,0):GOSUB 7 600:GOTO 4000 331Ø IF(R1-H1)>Ø THEN PRINT" ";C I\$(X,1,0);"'S DAMAGE IS";D1:XJ=V AL(M\$(VAL(CI\$(X,2,3)),8)):XJ=XJ-D1:M\$(VAL(CI\$(X,2,3)),8)=STR\$(XJ)): IF XJ=<0 THEN PRINT " "; CI\$(X, 2,Ø);" IS DOWN":F(X)=Ø:JJ\$=CI\$(X ,2,Ø):GOSUB 76ØØ:GOTO 4ØØØ 3320 GOTO 4000 3400 PRINT" SIMULTANEOUS INITIAT IVE":PRINT" ";CI\$(X,1,0);"'S DAM AGE IS"; D1: XJ=VAL (M\$ (VAL (CI\$ (X, 2 ,3)),8)):XJ=XJ-D1:M\$(VAL(CI\$(X,2 ,3)),8)=STR\$(XJ):IF XJ=<Ø THEN P RINT" "CI\$(X,2,Ø);"IS DOWN":F(X) =Ø:JJ\$=CI\$(X,2,Ø):GOSUB 7600

TRS-80 COLOR BASIC

by BOB ALBRECHT

Beginners

This entertaining self-instructional book is packed with games, experiments, scores of intriguing challenges, and activities related to fantasy role-playing games. The ideal introductory aid for kids, parents and teachers using the Color Computer.

John Wiley & Sons 605 Third Ave., New York, NY 10158 \$9.95

TRS-80 COLOR COMPUTER GRAPHICS

by DON INMAN

Intermediate
lending of computers

Explore the creative and imaginative blending of computers and color. This exciting book will enable you to explore all the graphics capabilities of Extended Color BASIC.

Reston Publishing Company 11480 Sunset Hills Rd., Reston, VA 22090 \$14.95

ASSEMBLY LANGUAGE GRAPHICS FOR THE TRS-80 COLOR COMPUTER A /

by DON INMAN and KURT INMAN

Advanced or Computer with

This book is specific to the TRS-80 Color Computer with applications using sound and graphics to illustrate how an assembler can be used to perform feats that would be quite difficult, if not impossible in the BASIC language.

Reston Publishing Company

\$14.95

DYMAX, P.O. 310, MENLO PARK, CA 94025

Dymax orders must be prepaid via check, money order, Visa or Mastercard. Sorry, no Purchase Orders or COD orders. Please add \$2.00 shipping and handling. California residents add 6% sales tax.



341Ø IF(R2-H2)>Ø THEN PRINT" ";C I\$(X,2,0); "'S DAMAGE IS"; D2: XJ=V AL(M\$(VAL(CI\$(X,1,3)),8)):XJ=XJ-D2:M\$(VAL(CI\$(X,1,3)),8)=STR\$(XJ)):IF XJ=<Ø THEN PRINT " ";CI\$(X, 1.0) " IS DOWN":F(X)=0:JJ\$=CI\$(X ,1,Ø):GOSUB 7600:GOTO 4000 4000 PRINT" PRESS ANY KEY": GOSUB 7Ø1Ø:NEXT X:RC=RC+1:X8=Ø:FOR X9 =1 TO 5:X8=X8+F(X9):NEXT X9:IF X 8=<Ø THEN 2Ø ELSE GOSUB 7500:IF K\$="N" THEN 20 ELSE 3060 6000 IF CC=0 THEN 6100 ELSE FOR X=Ø TO CC-1:CLS 6010 FOR Y=0 TO 10:PRINTC\$(Y);" = ";M\$(X,Y):NEXT Y:PRINT:PRINT"P RESS ANY KEY": K\$=INKEY\$: GOSUB 70 10:NEXT X:GOTO20 6100 CLS:PRINT"FILE EMPTY":FOR X =1 TO 1000:NEXT:GOTO 20 7000 K\$=INKEY\$:K=VAL(K\$):IF K<1 OR K>XX THEN X=RND(Ø):GOTO 7ØØØ: ELSE SOUND 150,1:RETURN 7010 IF INKEY\$="" THEN 7010 ELSE SOUND 150,1:RETURN 7100 K\$=INKEY\$:IF K\$<>"Y" AND K\$ <>"N" THEN 7100 ELSE SOUND 150,1 : RETURN 7200 PRINT"YOU MUST HAVE AT LEAS COMBATANTS IN THE FIL A COMBAT": FOR X=1 TO E TO HAVE 1000:NEXT:GOTO 20 7300 CLS:PRINT:PRINT" NATURAL WE INPUT WEAPON DAMAGE MUL APON. TIPLIER.":INPUT" ";CI\$(X,Y,2):RE TURN 7400 R1=RND(30):PRINT" ";CI\$(X,1 ,Ø);"'S ROLL";R1 7410 R2=RND(30):PRINT" ";CI\$(X,2 ,Ø);"'S ROLL";R2:GOTO3145 7500 CLS:PRINT:PRINT" ANOTHER CO MBAT ROUND? (Y/N)":K\$=INKEY\$:GOS UB 71ØØ:RETURN 7600 FOR J1=1 TO 9:IF CI\$(J1,J2, Ø)=JJ\$ OR CI\$(J1,2,Ø)=JJ\$ THEN F 761Ø NEXT J1:RETURN 10000 DATA NAME, CLASS, COMBAT ADJ USTMENT, LEVEL, STRENGTH ADJUSTMEN T, SPEED ADJUSTMENT, NUMBER OF ATT ACKS, NUMBER OF HIT POINTS, CURREN T HIT POINTS, PLUS OR MINUS FOR M AGIC, ARMOR CLASS 10010 DATA SHORT SWORD, 1, LONG SW ORD, 1.2, TWO-HANDED SWORD, 1.5, DAG GAR, .5, MACE, 1, LONG BOW, 1, CROSSBO W, 1.2, AXE, 1, SPEAR, .7, SLING, .5, HA ND AXE, . 6, FLAIL, . 9, NATURAL WEAPO N,Ø

The GMX 6809 CPU III

The GIMIX 6809 CPU III board is an advanced design, specifically intended for use with multi-user, multi-tasking operating extense.

Built on a multi-layer circuit board and utilizing high-speed, high-density logic, the GMX CPU III enhances the performance of the 2MHz 68B09 by providing such features as 1 byte/microsecond DMA block transfers from memory to memory or between memory and I/O devices, and advanced memory management with 2K segments and segment attributes. The board automatically arbitrates DMA contention between the on board DMA and external DMA devices such as disk controllers. The 2K memory segments allow more efficient memory usage. The segment attributes allow the trapping of out-of-range memory references, write protection, and a hardware single step function for software debugging.

The board prevents the execution of certain illegal instructions from crashing the system by monitoring interrupts to the 6809 and its response to them. If the processor does not respond to an interrupt within 128 clock cycles the board resets the 6809 and asserts a special reset vector. The system can then close down the offending task and resume normal operation. This also limits the length of time that interrupts can remain masked by a user preventing users from keeping the system from task switching and servicing other users.

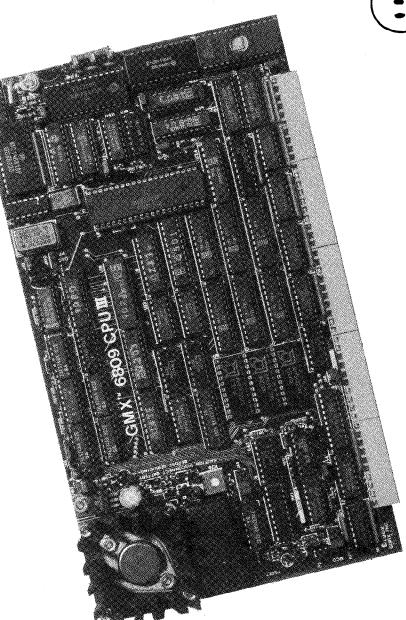
To further protect the system, the CPU board supports separate user and system states" with automatic switching to the system state in response to interrupts and system (SWI) calls. Certain functions and memory areas can only be accessed in the system state, preventing unauthorized accesses.

The GMX CPU III also includes a full function time-of-day clock with year and automatic leap year/daylight savings time correction, and a 2K scratchpad RAM; both with battery backup. To provide precision timing functions, a 6840 FTM with a separate 500 KHz precision (0025%) time base oscillator is included. The ascillator is easily user replaceable to provide other time base frequencies (750 KHz maximum). The single EPROM socket will accept 2K, 4K or 8K EPROMS, with a maximum of 4K mapped into the system address space at any one time. Software switching is implemented by selecting the upper or lower half of an 8K EPROM under hardware or software control.

OS-9 GMX III Operating System

OS-9 GMX III is an enhanced OS-9 Level II that takes full advantage of the features of the GMX CPU III. As a result, the system is faster, more memory efficient, and a more secure multi-user, multi-tasking operating system than the original OS-9 GIMIX II, while retaining complete software compatibility. Throughput is enhanced by the memory to memory DMA and the automatic task switching, while the memory attributes and illegal instruction trapping protect the system and individual users from each other. Sharable system modules in RAM are write protected to prevent tampering. Memory mapping in 2K segments and the ability to load modules in non-contiguous RAM provide more efficient memory utilization. Each task can be allocated a full 64K of RAM, with no operating system overhead in the tasks address space.

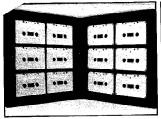
UniFLEX for the GMX 6809 CPU III and Intelligent I/O boards is in development.

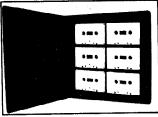




⊑IMIX™ 1337 West 37th Place • Chicago, Illinois 60609 • (312) 927-5510 • TWX 910-221-4055

ELIMINATE THE CLUTTER



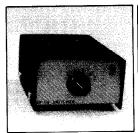


THE ORGANIZER ALBUMS TO HOLD YOUR CASSETTES

Store and organize your cassette library. The Organizer is constructed of black vinyl with rigid molded plastic frame to prevent crushing. Label holder welded on the spine for quick identification of contents. Order albums filled with BASF-DPS, C-10 tapes and get an even better deal!

item	Trice	
Organizer-12 with Tapes	\$12.95	
Organizer-12 without Tapes	\$6.95	
Organizer-6 with Tapes	\$8.95	
Organizer-6 without Tapes	\$4.95	
,		

Shipping: \$2.00 for first item + \$.50 for each additional item.





THE COCO-SWITCHER A QUALITY PIECE OF HARDWARE

The CoCo Switcher allows you to hook up three peripherials to your RS-232 jack. Connect your modem, printer and any other RS-232 compatible peripherial to the CoCo Switcher. Select among these peripherials at the flick of a switch on the front of the CoCo Switcher or turn them all off. No more scrambling around behind your computer. No more risk of harming your computer's RS-232 port. An LED on the CoCo Switcher shows if your computer is on or off at a glance.

The CoCo Switcher is contained in a sturdy black anodized steel box which sits firmly on rubber feet.

Dimensions: $2\frac{1}{2}$ " (64mm) x 4" (102mm) x 5%" (150mm) \$39.95 plus \$2.00 shipping and handling

MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory



316 CASTILLO STREET SANTA BARBARA CALIFORNIA 93101 (805) 962-3127

California Residents, Add 6% Sales Tax to Orders

THE COCO-WRITER

MORETON BAY SOFTWARE'S NEW WORD PROCESSING SYSTEM

(For the TRS-80 and TDP-100 Color Computers)

EDITING FEATURES

Pleasant green, white and black display. Full screen editing with cursor control. All keys repeat automatically. The word wrap-around eliminates split words on the screen. Edit any ASCII file, including Basic programs. Use the calculator functions of your computer without losing your document in memory.

Insert, delete or type over characters.
Insert, split, delete or copy lines.
Insert, copy, move or delete blocks of text.

All insert, delete, move and copy commands are completed virtually instantaneously. Instantaneous response to keyboard input. Even the fastest typist is not likely to out pace the CoCo-Writer. Find any word or character string in the document. Memory count and status indicators show on the edit screen. All 128 ASCII characters can be entered from the keyboard.

PRINTING FEATURES

Justify text at right or left margin. Justify text at both margins simultaneously for a professional looking document (such as this text). Automatically center text for titles and letter heads. Automatically number pages beginning at any number between 0 and 255. Print part or all of a document. Repeat printing of all or any portion of a document up to a 100 times. Select single sheet or continuous form printing. Embedded printer controls. Change justification, print font, and line spacing with commands in the text which do not print in the document. Print in upper/lower case or all capital letters.

TAPE FEATURES

Document memory space with 16K: 7424 characters. Memory space with 32K: 23,808 characters. The CoCo-Writer has the same features on either a 16K or 32K system and automatically adjusts to memory upgrade. Load and save files in ASCII or binary format. Load and edit the ASCII files produced by other word processors. Save part or all of a document on tape. Merge tape file into existing document in memory.

ADDITIONAL FEATURES OF DISK VERSION

Spool printing feature allows simultaneous editing and printing. Menu selections simply and quickly controlled with cursor. Control I to 4 disk drives. Load and save files on disks in any one of these drives. Split screen disk directory for all disk input and output menus. Improved directory scrolling. File names do not disappear off the top of the screen. Error trapping for all disk file names. If you enter an invalid command, the command will be terminated and the system will report the type of error.

CoCo-Writer comes with excellent documentation. The clearly written manual includes a table of contents and an index. A separate, sturdy, laminated card contains a summary of all commands for quick reference.

CASSETTE VERSION 16K OR 32K EXTENDED BASIC \$34.95 DISK VERSION ON CASSETTE 16K OR 32K EXTENDED BASIC \$44.95

(Protect your investment! Quick and automatic cassette load onto disk providing a dependable disk backup.)

Talking Speller 'Works' — But Is It Worth Using?

Superior Graphic Software's Talking Speller is a drill program using voice playback through the television monitor to preview a set of spelling words, dictate them to a student, prompt corrections and compute the student's test score. It requires 16K of memory, but Extended Color BASIC is not required. When loaded from cassette, the menu shows two program options.

Program Option 1 allows the teacher to create a spelling drill by typing in selected words, then dictating them into the cassette recorder. The program prompts the dictation by flashing the words on the screen, one at a time, then turning the cassette motor on and off, allowing approximately seven seconds for each word to be spoken (and recorded) twice. There is no limit to the number of words that can be entered in the drill, and the teacher can prepare and file on cassette a number of different spelling lists.

Program Option 2 tests the student, who is first asked if he/she wants to preview the list. If the answer is "yes," the words are spelled, one letter at a time, accompanied by tones from the speaker. Then the test begins: The program turns on the cassette motor, plays the dictated words through the monitor speaker, pausing after each word to wait for the student's answer. If the word is spelled correctly any of three times, the program plays a fanfare and prints praise on the screen. If the student misses once or twice, the program supplies hints in the form of blank spaces on the screen

showing which, if any, letters the student has correct. After the third unsuccessful try, the program fills the screen with the word, correctly spelled, then moves to the next word on the list. At the conclusion of Option 2, the student's score is computed, including the number of words spelled correctly on the first, second and third try.

Talking Speller does everything its designers claim for it. It frees a teacher from dictating spelling lists to the class and allows for a highly individualized approach to spelling dictation.

However, like so many other language arts software programs on the market, this one devotes the power and appeal of computers to a task that is not only fairly trivial, but pedagogically obsolete. A solid body of language arts research suggests that spelling words are not learned best through drill or dictation. Spelling lists are too far removed from everyday uses of writing, and students therefore do not retain the words for long after the drill. Spelling words are more easily mastered in the process of proofreading a paper containing one's own choice of language. In this respect, having students write papers on computer word processing programs with spelling checkers to guide them in finding errors will prove a superior method of helping students learn to spell.

For a teacher who still drills students through spelling lists, *Talking Speller* might be a useful addition to the classroom software library. But computers in the classroom can be put to much better uses.

(Superior Graphic Software Products, P.O. Box 451, Canton, NC 28716, \$19.95 on cassette)

-Stephen N. Tchudi



To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User*— the international, independent magazine for Dragon owners.

Each issue of *Dragon User* contains:

- reviews of the latest software
- programming advice for beginners
- hardware projects

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only \$29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

ı	Subscription order form. Receive a free book and save money by taking out a
ı	long-term subscription — a two-year subscription saves 10%, a three-year
ľ	subscription saves 20%. In addition, long-term subscribers will receive a free
ı	copy of either \square The Working Dragon or \square Dragon Games Master. Please send
ı	a check, made payable to <i>Dragon User</i> , with this form,
	Start my subscription from the following issue

Start my subscription from the following issue

Name...

Signed

..... Datė......

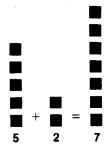
Subscription rates US and Canada airspeeded ☐ US\$29.95 for 12 issues/1-yēār ☐ US\$53.90 for 24 issues ☐ US\$71.90 for 36 issues. Send this form to Dragon User, Hobhouse Court, 19 Whitcomb St, London WC2 7HF, England.

Mathfact—Educational But Not Exceptional

Mathfact by B5 Software Company has some educational value, but does not utilize the capabilities and power of the CoCo. As an educator, I maintain that the most important aspect of a program is the ability to convey an idea in a different manner than could be presented in a textbook. Mathfact falls short on this point.

Program loading is error free and is configured for a 16K CoCo Extended BASIC. The program is drill and practice in the area of math facts (addition, subtraction, multiplication, division). Two difficulty levels are available for all the fact areas. The first screen is the menu. The user is asked to select the difficulty level and the targeted practice area. It is assumed that the user is old enough to read the menu to choose the proper options. This program must be used with adult supervision for proper implementation as a useful learning tool. The drills are timed and score and time are given at the end of the lesson.

Level one constitutes a good teaching practice of using the concrete before the abstract is taught. The problems are presented in graphic form as shown in the example.



This provides the concrete practice before the user moves to the more complex levels. This method is standard for the four fact areas.

Level two allows the user to select a number from one to nine. This is the fact that will be practiced. Problems are presented one at a time and are in page format. If the student misses the problem, the program branches back to the concrete level to allow the user additional practice. The user must correctly answer the problem before continuing in level two. The instructor cannot change the number of problems and there is no consideration for too many incorrect responses in the first level. The user could answer wrong all day.

If users correctly answer all questions, they are given the choice to select a game. The game is a number guessing game. The computer picks a number between two limits and the user must guess the number. Hints are given (too high or too low). The user is given only four chances to guess the number. For young children, this is totally inadequate. A child's reasoning abilities are not sufficiently developed to guess the number in four tries. The suggested grade levels are up to grade five. A fifth grader would have a tough time guessing in four attempts.

After the game is completed, the program branches back to the same drill that was previously selected or a new option may be entered. The program has some major educational flaws that could be corrected to make this a very desirable program for use in the classroom or home.

Report Card

Educational Value = C

Comment—Drill and practice programs are best left for the textbook and worksheet. Not challenging or motivating beyond the normal classroom situation.

Appropriateness = C

Comment—Again, it is appropriate for drill and practice programs to be used, but leave them on paper unless presentation is unique.

Objectives Met = A

Comment—The program meets all the objectives spelled out in the documentation for all areas contained in the program.

Error Handling = B

Comment—Errors are handled satisfactorily in level two. In level one, there is no limit to the amount of incorrect responses. Also, in level one, the user can type in letters or numbers for an answer. If more than a few numbers are entered, the program crashes. Students fooling around could easily bomb the program. The BREAK key is not disabled which can cause problems with smaller children.

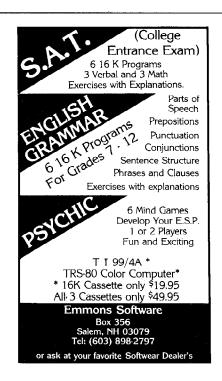
Final Grade = B-

Enhancement

The instructor should be able to change the number of problems presented and select the timing option. More graphics and sound would be a nice addition. Limits should be set for incorrect responses. When the limit is reached, the answer should be given. The number of guesses in the game should be increased and the reward for getting the correct answer should be varied and motivating. Good possibilities for an excellent program.

(B5 Software, 1024 Bainbridge Pl., Columbus, OH 43328, \$16.95 on tape)

-Rick Cobello



OMPUTERWARE® has it all.



BIO DETECTOR™

connects the Color Computer to a composite video monitor (color or monochrome) with NO SOLDERING!

Our disk systems use top-quality drives plus cables, controller, Radio Shack DOS & manual.

New half-size drives available for only \$30 extra

earn about yourself & others using today's technology & your CoCo! Finger sensors lead to the Bio Detector that plugs into a joystick slot. Just load the program & wrap the finger-grips on the subject. Results will be graphic!

The Bio Feedback Program graphs galvanic skin response on the screen. Watch yourself key-up & relax! The Anxiety Attack Game is fun for all ages. You can't lie to Bio Detector! (Based on current lie detector techniques).

Bio Detector includes all hardware, software & instructions. Silver contacts give greater contact. Adjustable grips fit anyone. Be the first on your block to hook up"!

[Disclaimer: This is a toy, Results not admissible in court.]

DISK

Single drive, single sided

Single drive, double sided

Dual drives, single sided

Dual drives, double sided

Drives only

AMDISK: NEW 31/2" dual drives

Complete system

SYSTEMS

per drive.

SPECIALS



\$**34**95

\$24⁹⁵

S449

\$549

\$725

\$895

\$499

\$665

THE SOURCERER



Produces symbolic source code that can be assembled. Disassembles to disk, tape, printer. or screen. Position independent code. User defined symbol/label buffer area. 4 formats: hex dump, ASCII dump, full listing & symbolic mode. And more!! A programmer's dream! FAST!

\$3495 16K Cassette \$3995 16K Disk



TIME PATROL

Travel thru a time warp, meeting unique foes & friends.

32K Cass \$2695 32K Disk \$2995



MOON HOPPER

Traverse terrain, hills & craters while shooting off enemies.

32K Cass ^{\$}**24⁹⁵** 32K Disk \$2795



BLOC HEAD

Hop atop pyramids of cubes, dodging the evils.

16K Cass \$2695 16K Disk \$2995



JUNIOR'S **REVENGE**

Climb vines, avoid obstacles & creatures to save your father from the zookeeper.

32K Cass \$2895 32K Disk \$3195



DOODLE BUG

No. 1 Best Seller has great graphics, sound, & play. 16K Cass \$2695 16K Disk \$2995



HYPER ZONE

Way out 3D graphics from the cockpit of your spaceship! 32K Cass \$2695 32K Disk \$2995

MONITORS



\$10495 Hi-Res Green Screen \$15495 Taxan Amber Screen \$349⁹⁵ Amdek Color I

...FOR FLEX

New LOW PRICE for FLEX FLEX from Frank Hogg \$6900 Random BASIC \$7500 Editor \$5000 Macro Assembler \$50°°



New switching joystick \$1895 (requires our WICO adapter)

MACRO ASSEMBLER

Tops in the reviews! Complete macro conditional assembler (2 pass) with library files, repeat sequences, cross reference and FIND programs. Uses standard ASCII source files of any size.

32K Disk w/RSDOS . . . \$4985

64K Disk w/FLEX \$5000

Flexi-Fil



Collect: up to 35 elements per record, up to 240 characters per record. Unlimited file size. 5 data types.

Organize: you choose how data is stored & displayed.

Select: a subset using <. >, =, and, or with 36 different criteria.

Sort: ascending or descending by any field. Report: custom design reports & labels incl. page numbers, titles & column headers. Numeric fields can be automatically totaled.

Manual: extensive & easy to use.

Computerware is a trademark of Computerware



P.O. Box 668 • Encinitas, CA 92024 (619) 436-3512

VISA .		P.O. Box 668 • De Encinitas, CA 920	6-3512	
	DESCRIPTION	QUANT.	PRICE	TOTAL
		-3	HIP. & TAX TOTAĻ	
VISA 🗌	MASTERCARD 🗆	СНЕСК 🗀		
CARD # NAME ADDRESS		E:	XP	

Mail to: COMPUTERWARE®

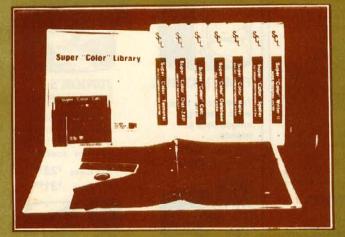
*Shipping: Under \$100 — add \$2 surface, \$5 air/Canada Over \$100 — add 2% surface, 5% air/Canada Calif. residents add 6% sales tax.

There's more ore — call or write for a complete catal More Software, More Hardware, and Books and Supplies and...

SIGNATURE .

Super "Color" Library™

Gold Label Software for the V.I.P. in Everyone



No matter what kind of problem you are trying to solve with the Color Computer, there is a program in the ever-expanding integrated. Super "Color" Library that will give you the solution: Faster, Better, Smarter!

Every Library program features MEMORY-SENSE to determine your computer's memory, from 16 to 64K, and adjusts automatically to maximize work space. All programs, except the Super "Color" Speller and Super "Color" Disk-ZAP. feature a true lowercase display with below line descenders. Each program has been written specifically for the Color Computer in fast machine code to be totally compatible for optimum performance — Something a motley assortment of programs from diverse sources or a passel of overpriced, wallet-FLEXing software from a bygone era simply can not achieve.

The Super "Color" Library has all the power speed, dependability and compatibility you will ever need so build your library a volume at a time or put the full power of the complete library of problem solvers to work right away.



Super "Color" Writer IITM

VERSION 3.0 By Tim Nelson THE INTELLIGENT WORD PROCESSOR



The Super "Color" Writer II is for those who desire the best. It is the most powerful, fastest, most dependable and versatile word processor available for the Color Computer, from 16 to 64K. The Super "Color" Writer II has features for the most demanding professional, yet it is easy enough for newcomers to master.

Of course the Super "Color" Writer II has all the features you would expect from the highest quality word processor, such as a clear, crisp and readable professional display with your choice of display colors. 9 display formats, standard 32x16 & 51-64-85x21 &24 with real lowercase descenders: full 4-way cursor control sophisticated edit commands, the ability to edit any BASIG program or ASCII textfile, seven delete functions, locate and change, wild card locate, a real block move & copy, word wrap-around, programmable tabs, display memory used and left, non-breakable space, multiple headers and footers, dynamic text formatting, comprehensive format parameters, use with ANY printer at any baud rate from 110 to 9600 baud, automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, optionally print comments, append text files, available in a ROMPAK cartridge for maximum work space, but that's only half of the story. No other program can even begin to compare in features with the Super "Color" Writer II.

TAPE \$69.95 ROMPA

Check These Exclusive Features

MEMORY-SENSE adjusts to computer's memory (16-64K) for maximum work space; TYPE-AHEAD, TYPAMATIC KEY REPEAT and KEY BEEP for the pros. 3 PROGRAMMABLE FUNCTIONS; AUTO PHRASE INSERT; COLUMN CREATION, TEXT FILE LINKING, HELP MENU. A TRUE EDITING WINDOW IN ALL 9 DISPLAY MODES; TRUE FORMAT WINDOW to display line lengths up to 255 characters, with horizontal and vertical scrolling to replicate the printed page including centered lines, headers, footers, page breaks, page numbers, margins, giving a perfect printed document every time. Also makes hyphenation a snap; TRUE AUTOMATIC JUSTIFICATION for neat, even left and right hand margins. Ability to use CHARACTER CODES for printing special characters available with your printer, freedom to embed as many PRINTER CONTROL CODES as desired anywhere in the text, EVEN WITHIN JUSTIFIED TEXT; 90-plus page tutorial manual

ADDITIONAL DISK FEATURES: Read a directory. Display free granules, Save with Automatic Verification, Load and Append ASCII files, and BASIC programs. Kill files, and Link files from disk for continuous printing 54K bytes of workspace available with a 64 K system. Only the best offers all of these features.

DISK \$99.95



Super "Color" Speller™

By Peter A. Stark

The Super "Color" Speller is a fast machine-code proofreading program to correct Super "Color" Writer files. Automatically proofreads your documents against a 20,000 word stock dictionary, plus your own customized dictionary and corrects typos or marks them for special attention

AVAILABLE ON DISK ONLY \$69.95

All library programs also available on Amdisk III diskettes for an additional \$3.00

ROMPAK \$89.95

32x16 & 51-64-85x21&24 Display 16 Thru 64K Too! NEW Super "Color" Calc™ Super "Color" Termina

ELECTRONIC SPREADSHEET By Kevin Herrboldt THE FINEST TERMINAL PROGRAM ANYWHERE!
Version 3.0 By Dan Nelson

Now you can answer those "What if?" financial projection, forecasting, budgeting, engineering and calculating questions with precision, speed and power using the Super "Color" Calc, truly the finest electronic worksheet and financial modeling program available for the Color Computer, from 16 to 64K. Now every Color Computer owner has access to a calculating and planning tool rivaling VisiCalc" containing all its features and commands and then some. You need only change one variable and you instantly see how that change affects your assumptions You can even use VisiCalc templates freely with Super "Color" Calc! Combine spread sheet tables with Super "Color" Writer II documents to create ledgers, projections, statistical and financial reports and budgets

Features include: 9 display formats; standard 32x16 & 51-64-85x21&24 with real lowercase descenders * MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space, Full-size 63x256 worksheet * Easy to use * HELP Menus to make learning faster ' Machine code speed and high precision ' Total flexibility in calculating * Up to FOUR VIDEO DISPLAY WINDOWS to compare and contrast results of changes * Sine and Cosine functions, Averaging, Exponents, Algebraic functions, and base 10 or 16 entry ' Multi-layered Column and Row Ascending and Descending sorts * Locate formulas or titles. in fields * Easy entry, replication and block moving of frames Global or Local column width control up to 81 characters each Create titles of up to 255 characters * Typamatic Key Repeat * Key beep * Type-ahead * Print up to 132 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet. Enter control codes for customized printing.

DISK FEATURES: Read a directory; Display free granules; Kill files, Save with Automatic Verification, Load files, Append disk files for complete worksheet printing, 54K bytes of worksheet space available with a 64K system.

Tutorial and sample templates are supplied with the program.

ROMPAK \$89.95

DISK \$99.95

Disk requires 32K for lowercase display

Super "Color" Disk-ZAP™

Now the dreamed-of repair of 1/0 errors is a reality. The Super "Color" Disk-ZAP" is the ultimate repair utility for simple and quick repair of all repairable disk errors. Designed with the nonprogrammer in mind, the Super "Color" Disk-ZAP" will let you retrieve all types of bashed files, including BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to show HEXIDECIMAL and ASCII displays simultaneously. You are able to: Verify or modify disk sectors at will. Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer or any other RS-232 device * Search the entire disk for any grouping of characters ' Copy sectors ' Backup tracks or entire disks . Repair directory tracks and smashed disks . Full prompting to help you every step of the way * 50-plus page Operators Manual which helps you simply and quickly fix the vast majority of disk errors, and teaches the rudiments of disk structure and repair

AVAILABLE ON DISK ONLY \$49.95

The best has become even better, with many new features including 9 display formats, 32x16 & 51-64-85x21&24 with real lowercase descenders, plus compatibility with the 64K Color Computer. This user-friendly program makes communicating with ANY computer a breeze even for a newcomer. Communicate using your modem with all the popular information services such as Dow Jones. Compuserve. The Source, and local BBS's, clubs, friends, or the main-frame at work. You can also communicate Girectly with other microcomputers, such as the TRS-80 I/III, II, other Color Computers, Apples, IBM PCs, etc., via RS-232 without using a modem. Save the information or PRINT IT! FEATURES: MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space: Selectively print data at baud rates from 110 to 9600 * 54K of data storage with 64K disk system. 128 character ASCII keyboard * Automatic graphics mode * Word mode (word wrap) for unbroken words * Send & receive Super "Color" Writer II, Database & Calc files, ASCII files, Machine Language & BASIC programs ' Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 5 6 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 ' Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Unique CLONE feature for copying any tape * Lower case masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Files compatible with other

ADDITIONAL DISK FEATURES: Works with up to four Disk Drives, Call a directory, Print free space, Kill disk files, Save with Automatic Verication and Load textfiles or BASIC programs, Save and Load KSM'S to the disk

TAPE \$49.95

ROMPAK \$59.95

DISK \$69.95

Tape and disk versions require 32K for lowercase display.

Super "Color" Database™ Includes Mail Merge Capabilities

This high speed machine language program including true lowercase displays fills all your information management needs. be they for your business or home. Inventory, accounts, mailing, lists, family histories, you name it, the Super "Color" Database

will keep track of all your data.

The Super "Color" Database features MEMORY-SENSE to adjust to computer's memory (16-64K) for maximum work space. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design, each divided into as many fields as you need. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending order. The math package performs arithmetic operations and updates other fields which is especially useful when used as an order entry and invoicing system. You can create reports, or lists for mailings, or whatever. Create files compatible with the Super "Color" Writer II and Terminal. Up to five different print formats are available, and control codes may be imbedded for customized printing

AVAILABLE ON DISK ONLY \$79.95

For Orders ONLY Call Toll Free 1-800-328-2737

Order status and product support call (612) 881-2777 MAIL ORDERS: \$3 U.S. Shipping (\$4 CANADA, \$10 OVERSEAS) Personal checks allow 3 weeks

Available at Dealers everywhere. If your Dealer is out of stock ORDER DIRECT!

TRS 80 is a trademark of Tandy Corp. Visicals is a trademark of VisiCorp.

WE TAKE THE COLOR COMPUTER SERIOUSLY
AUTHORS' SUBMISSIONS ARE ENCOURAGED.

Genealogizers Might Say Family Is Great, Great, Grand...

Family is a genealogical data base program for a 32K ECB CoCo with a Line Printer VII. The program uses just about all of CoCo's memory in order to hold data for eight generations. This program has no fancy bells and whistles, but it appears it would be useful for anyone interested in their family tree. The program will allow you to enter the following information about your family's roots: name, date of birth, place of birth, date of marriage, place of marriage, number of children, date of death, place of death, buried at, and occupation. The entries for children and marriage are filed for the husband only to save memory.

The program is menu driven and was easy to use once I figured out the reference number system used to identify each person in the family tree. In addition to creating a file, you can correct previously entered data rather easily by entering the reference number of the file you want to edit and then follow the on-screen prompts.

The program requires so much memory it cannot be used with a disk system but the program is written in BASIC so I

suppose it could be modified to be compatible with a disk. This, of course, would reduce the number of generations you could enter. In order to list the information to the printer, you must first save the data to tape and then load a second program which will then read your data tape and give you three options for printouts.

Option number one is a pedigree chart. This option will print a chart of any five generations in your file. I found this to be an interesting chart, but could only find information for four generations of my family, so I didn't get full use of the chart. Option number two is a family group chart that prints all available information on a family group (husband and wife). I didn't find this chart as useful as the pedigree chart, but maybe if I knew more about genealogy I could have found a use for it. The last print option is a reference index. This printout will list all the names you have on file and their corresponding reference number. The reference numbers are needed if you want to edit a particular file.

The three pages of documentation are well written and will have you using the program in a matter of minutes. If you are into "family trees" then I think this program could be useful.

(TWM, P.O. Box 232, Lititz, PA 17543, 32K ECB, \$9.95)

-Michael Hunt

"Fun For The Whole Family"

Tired of one or two player games that are boring for everyone but the player? Do you wish you could get the children interested in a game that has educational qualities and is entertaining enough to keep them interested? Then you need ALPHABET SOUP, a word recognition and spelling game that has all the challenge and excitement of an arcade game plus the fun and competition of a board game. With room for up to five players and nine skill levels, ALPHABET SOUP is great family fun. It's so much fun, the children won't even notice that their word recognition, spelling, vocabulary, and typing skills are steadily improving.

ALPHABET SOUP \$14.95

WITH SCHOOL ABOUT TO BEGIN, IT'S TIME TO HELP YOUR CHILDREN SHARPEN THEIR MATH SKILLS! With our three math drill programs, your children can practice math skills that have grown rusty over the summer vacation and be ready to start learning new material immediately after school begins. Each program features five skill levels, entertaining music and graphics, and personalized prompts to keep the children interested and motivated.

COLOR MATH QUIZ \$14.95
FRACTION MATH QUIZ \$14.95
DECIMAL MATH QUIZ \$14.95

For more information about our line of programs, hardware, and hardware kits for the Color Computer, write for a free catalog.

ALL PROGRAMS ARE FOR THE COLOR COMPUTER OR TDP-100 WITH A MINIMUM OF 16 K OF MEMORY AND EXTENDED BASIC.

SEND CHECK, MONEY ORDER

OR PURCHASE ORDER TO:

CREATIVE TECHNICAL CONSULTANTS

P.O. Box 652 Cedar Crest, NM 87008



ENDICOTT SOFTWARE

TAPE CAROUSEL

JOYSTICKS

DEALER & CLUB INQUIRIES INVITED

\$15.00 EACH

TWO OR MORE \$13.50 EACH



Organizes your cassettes. Reduces the clutter of your work area. Holds up to 25 cassettes in individual compartments. Units are stackable and revolve for easy access. Clear plastic sliding covers keep tapes dust-free (tapes not included). Great for your stereo

ONLY \$19.95



TWO FOR

\$37.95

"In use, we found the ENDICOTT JOYSTICK to be smooth and responsive. ...built to last, the Endicott model is a solid buy".

"...provided the best feel of all the joysticks tested. ...(a) rugged unit at an affordable price."

- 80micro, March 1983

- the RAINBOW, October 1982 6 Month Warranty. No adaptor - plugs right in!

MARK DATA PRODUCTS

SUPER - PRO REPLACEMENT KEYBOARD KIT

Computers made after or about Oct. 1982 require adapter.

> KEYBOARD: \$69.95 ADAPTER: \$4.95

(205) 881-0506

PHONE OPEN 7 DAYS A WEEK!

Best available! Smooth professional touch. Identical keyboard layout eliminates relearning key locations. Simple installation! No soldering or wiring. Professional appearing installation.

COLORKIT Full of powerful software development tools. A fantastic utility!

\$29.95

\$34.95

EXCELLENT PROGRAMS FROM LEADING SOFTWARE HOUSES

NEW DISCOUNTS ON SOFTWARE!

10% OFF LIST PRICE OF ONE

15% OFF OF TWO OR THREE

20% OFF OF FOUR OR MORE

We will not be undersold!

Send us any current ad showing a lower price than ours on anything we carry and we will honor it (mail order only). Don't forget, WE PAY SHIPPING!

We now carry disk versions. (Requires 32K up	nless othe	rwise noted)	ANTECO SOFTWARE	•	
ELITE SOFTWARE		,		Т	ROM PK
ELITE SUFTWARE	т	D	KATERPILLAR ATTACK		\$26.95
★ ZAKSUND Fantastic!	\$24.95	\$27.95	8-BALL (POOL) All balls shown. Full Cue control.		\$29.95
			INTERGALACTIC FORCE Experience trench	24.95	\$29.95
ELITE-CALC (16, 32, 64K) Spreadsheet	\$44.95	\$44.95	warfare in your X-Wing fighter.		
SPECTRAL ASSOCIATI			*HOUSEHOLD EXPENSE MANAGER Menu-driven	\$19.95	*****
SPECITAL ASSOCIATI	T	-	with 30 household categories. Screen or printer		
LANOPO A L. H. LUI		D	output.		
* LANCER A Jousting good time.	\$21.95	\$25.95	*STOCK ANALYZER AND TREND Track your	\$21.95	
★ MS. GOBBLER Gobbler's female counterpart.	\$21.95	\$25.95	stocks. Disk compatible. Optional printer	WZ 1.55	
WHIRLYBIRD RUN Great flying action.	\$21.95	\$25.95	output.		
GALAX ATTAX Excellent Galaxian	\$21.95	\$25.95	output.		
SPACE RACE Excellent Omega Race	\$21.95	\$25.95	COGNITEC		
PLANET INVASION Quick action Defender	\$21.95	\$25.95	COGINITEC	_	_
*SPACE TRADERS Buy stock in universe	\$14.95	\$19.95	TELEMBITED OF COMMON OF THE	T	D
companies to become the richest. Like Acquire.			TELEWRITER 64 (For 16, 32, or 64K)	\$49.95	\$59.95
*COMPUVOICE A phoneme speech generation	\$34.95	\$39.95	THE word processor for the CoCo!		
program.		755.55			
MARK DATA PRODUCT	rs		PRICKLY-PEAR SOFTWARE TAKE 15% O	FF THE LIST	
MAIN DAIA I NODOC	, T	D		т.	D
COSMIC CLONES Challenging!	\$24.95	29.95	SHAFT New arcade game	\$24.95	\$29.95
	\$24.95		*JUNGLE Adventure!	\$19.95	\$24.95
EL BANDITO Get the food and run.		\$29.95	THE DISK MANAGER A must!		\$29.95
GLAXXONS Excellent adaptation.	\$24.95	\$29.95	THE DISK MASTER Excellent!		\$24.95
SPACE RAIDERS Not just another Invaders game.	\$24.95	\$29.95	★ FLIGHT Realistic flight simulator	\$19.95	\$24.95
CAVE NUNTER Grab the treasure and outrun the	\$24.95	\$29.95	*8-BIT BARTENDER Party fun 100 + recipes.	\$19.95	\$24.95
creatures.			*VIKING Go from peasant to King!	\$19.95	\$24.95
HAYWIRE Will drive you BERZERK!	\$24.95	\$29.95	*GANGBUSTERS Lead a life of crime and win!	\$19.95	\$24.95
			PANDORA'S GAME BOX Includes: "pac" game,		
COMPUTERWARE			"defender type" game, Divebomb, Blockade,	\$24.95	\$29.95
	T	D			
★ GRAN PRIX Test your driving skill.	\$21.95	\$26.95	slot machine, and Squares (like cube).	***	
★ MOON HOPPER Get to moon-base alive	\$24.95	\$29.95	*PREREAD I, II & III (Three tapes)	\$24.95	•••••
BLOC HEAD Tricky action.	\$26.95	\$29.95 (16K)	Prepare your preschooler to learn to read		
NERBLE FORCE Excellent Defender clone.	\$24.94	\$29.95 "	DETROOM EDETI ANDE ADO		
MEGAPEDE Most challenging version.	\$21.95	\$26.95 "	PETROCCI FREELANCE ASS	OCIATES	
SHARK TREASURE Don't get eaten!	\$21.95	\$26.95 "		T	D
SPACE AMBUSH Action like Galaxian.	\$21.95	\$26.95 "	★ INSPECTOR CLUESEAU Find the murderer in	\$19.95	
DOODLE BUG Like Ladybug	\$24.95	\$29.95 "	this excellent graphic adaptation of Clue.		
	\$21.95		*STAGECOACH Graphic Adventure	\$19.95	
RAIL RUNNER Dodge trains and handcars		\$26.95 "	*STRESS EVALUATÓR Measure and manage	\$24.95	
PAC ATTACK II Great gobbler. New graphics.	\$24.95	Ψ Σ 0.33	your stress		
STORM A real Tempest!	\$24.95	\$29.95 "	,		
COLOR INVADERS Like the original.	\$19.95	\$24.95 "	Additional lictings in our tree antale	11	!.
SYNTHER · 7 Music synthesizer	\$21.95	\$26.95 "	Additional listings in our free catalo	g · can	or write.
TOM MIX			*Requires 16K Ext. Basic Minimum. * Requires 32k	Ext. Basic	Minimum
	т	D	Others 16K Std. Basic Minimum	l.	
THE FROG	\$27.95	\$30.95	24010 Million		
+ GRABBER	\$27.95	\$30.95			
* SPACE SHUTTLE Control the Space Shuttle	\$28.95	\$30.53 	WE DAY 0		
* DONKEY KING 4 Screens - Full action!	\$26.95	\$29.95	WE PAY SHIPPIN	G!	
	\$17.95				
★ COLOR GOLF Challenging! Uses full set of	\$17. 5 3	•••••	Other companies ask you to ADD \$1, \$2, \$3, or	more for shi	pping
Clubs.	\$27.05	¢20.06	WE NEVER OD TO U.S.A., Canada, M	exico.	
TRAP FALL Many "Pitfalls" here!	\$27.95	\$30.95	Add \$2.00 for C.O.D. (U.S.A. Only). Allow 2 weeks	for checks t	o clear.
*ESCAPE FROM S.P.E.C.T.R.E. Graphic Spy Adv.	\$17.95				-
*KATERPILLAR ATTACK Look out for spiders!	\$21.95	\$24.95	SHIPPING-ALL OTHER COUNTRIES: Add \$2.00 for ea	ch software	item Add
*MOON LANDER 2 games in 1	\$17.95	******	\$3.00 for each Joystick, \$10.00 for each carousel and \$	10 00 for con	h kaybaard
THE FIXER Loads 600 hex programs to disk	\$17.95	*****	Items will be shipped air mail.	. 0.00 101 880	n keybbaid.
DISK TO TAPE Dump most disks to tape	\$17.95	*****			
TAPE TO DISK Load most tapes to disk	\$17.95	*****	ALL PAYMENTS MUST BE IN U.S. F	JNDS.	
*SPELLING TEST Provides a standard oral quiz.	\$19.95				
,			ENDICOTT SOFTWARE		
ARIZIN			P. O. Box 12543, Huntsville, AL	35802	
ANZIN	_	_			





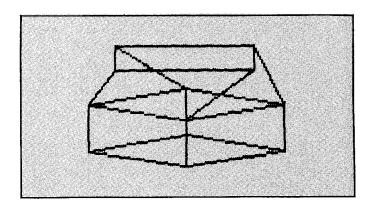
Computer user to create complex images on the 32K BASIC color computer's high resolution graphics screens. The program is completely menu driven. All the user must do is load it and type RUN. It is best to clear the screens first. On the first running when the user requests that all screens be cleared, the program will sometimes halt. To correct this problem, simply type the command RUN again. At any time a graphic picture is shown, the user can return to the main menu by pressing the space bar.

The program will draw N-sided objects. The more sides an object has, the more that object resembles a circle. The first object or subgroup should be drawn in the "new object" mode. Once this object is completed a new subgroup can be drawn and connected to the one before by using the "connect to previous object" option. You can connect objects only if they contain the same number of sides. Whether the object is at a different angle or not, is unimportant, they will still connect. It is up to the user to determine whether the object will fit on the screen. If the object is too large, the program will halt and report an ?FC Error. Once an image has been drawn, the user can press the Break key and call up a screen dump routine and print the object on a dot matrix printer. Images are not in color, though they produce excellent pictures.

The center of the screen (point 128,96), is considered the point (0,0) by this program. When the user specifies a point, he should keep this in mind. By the way, the point you specify represents the center of the object not the sides. A subgroup is counted each time the user executes the new

(Ed Krikorian is a third year student of computer science and holds an A.A. degree from the University of Florida.)

object or connects to previous object options. For determining angles the best analogy to use is the planet Earth. The equator circle would be a horizontal angle of 0 degrees. A circle drawn from the North Pole to the South Pole would be a horizontal angle of 90 degrees. For vertical angles think



of a cube on a flat table with one side facing you. This represents a vertical angle of 45 degrees. If you turn the cube so that a corner now faces you, you have changed its vertical angle to 0 degree. If you have trouble visualizing these examples, study the sample pictures or try some random input values.

When the "movable objects" mode has been selected the computer will ask for the number of subgroups. It will then prompt you for the pictures data in the usual manner. The only difference being that once all the subgroups are entered the computer will memorize all the moves and draw the object at different horizontal or vertical angles the number of times the user specifies. Each time it will draw your object with the incremented angles. This gives the user a new



QUEST — A NEW IDEA IN ADVENTURE GAMES! Different from all the others. Quest is played on a computer generated map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a life or death battle to the finish. Playable in 2 to 5 hours, this one is different every time. TRS-80 Color, and Sinclair, 13K VIC-20. Extended BASIC required for TRS-80 Color and T199/A. \$14.95 each.

32K TRS 80 COLOR Version \$24.95. Adds a second level with dungeons and more Questing.



WIZARDS TOWER — This is very similar to Quest (see above). We added wizards, magic, dragons, and dungeons to come up with a Quest with a D&D flavor. It requires 16k extended color BASIC. 13k VIC, Commodore 64, TRS-80 16k Extended BASIC, T199/A extended BASIC. \$14.95 Tape, \$19.95 Disk.

Authors — Aardvark pays the highest commissions in the industry and gives programs the widest possible advertising coverage. Send a Self Addressed Stamped Envelope for our Authors Information Package.



ZEUS — It's fast and furious as you become the WIZARD fighting off the Thurderbolts of an angry ZEUS. Your Cone of Cold will destroy a thunderbolt and your shield will protect you — for a while. This is the best and highest speed arcade action we have ever done. Difficulty increases in wave after wave, providing hours of challenging fun and a game that you may never completely master. Commodore 64, Vic20 (16k expander), and 16k TRS-80 Color Computer. (ALL MACHINE CODE!)

\$19.95 tape \$24.95 disk. (Tape will not transfer to disk.)



ADVENTURES!!!

The Adventures below are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer, commands like "Look in the Coffin" and "Light the torch.")

Adventuring requires 16k on Sinclair, and TRS-80 Color. They require 8k on OSI and 13k on VIC-20. Now available for TI99. Any Commodore 64.

\$14.95 Tape - \$19,95 Disk.

ESCAPE FROM MARS (by Rodger Olsen)

This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID (by Rodger Olsen)
This is our most challenging ADVENTURE.
It is a treasure hunt in a pyramid full of problems. Exciting and tough!



SEAWOLFE — ALL MACHINE CODE In this high speed arcade game, you lay out patterns of torpedoes ahead of the attacking PT boats. Requires Joysticks, at least 13k RAM, and fast reflexes. Lots of Color and Sound. A fun game. Tape or Disk for Vic20, Commodore 64, and TRS-80 Color. NOTE: tape will not transfer to disk!

\$19.95 Tape - \$24.95 Disk.



Dungeons of Death — This is the first D&D type game good enough to qualify at Aardvark. This is serious D&D that allows 1 to 6 players to go on a Dragon Hunting, Monster Killing, Dungeon Exploring Quest. Played on an on-screen map, you get a choice of race and character (Human, Dwarf, Soldier, Wizard, etc.), a chance to grow from game to game, and a 15 page manual. 16k Extended TRS-80 Color, 13k VIC, Commodore 64. At the normal price for an Adventure (14.95 tape, \$19.95 disk), this is a giveaway.

Dealers — We have a line of about 100 original programs for the machines listed here. We have High speed Arcades, Quality Adventures, Word processors and Business Software for Small machines. Better yet, we have excellent Dealer support. Phone for information.

Send \$1.00 for Complete Catalogue - Please specify system on all orders - \$2.00 Shipping Charge on each order



AARDVARK L.T.D.

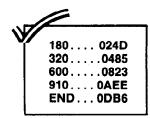
2352 S. Commerce, Walled Lake, MI 48088 / (313) 669-3110

Phone Orders Accepted 8:00 a.m. to 4:00 p.m. EST. Mon.-Fri.



perspective on what he or she has drawn. As the computer draws, in the movable object mode, it uses the graphic screen that the user is not currently looking at. Once the object has been completed, it will display the other graphic screen and draw on the one you were just viewing. The more subgroups an object contains, the longer it takes the computer to draw them. Have fun and may you draw something exotic.

The listing:



3Ø REM ***VERSION 3.Ø***** 4Ø REM ***DECEMBER 27,1982** 50 PCLEAR 8 6Ø PI=3.1415926 70 DIM H(200,1),AH(200,1),L(50,6 8Ø CX=128:CY=96 9Ø CLS 100 CLS:PRINT"MENU":PRINT"Ø.NEW OBJECT.":PRINT"1.CONNECT TO PREV IOUS OBJECT. ": PRINT"2. CLEAR SCRE ENS. ": PRINT"3. VIEW SCREENS. ": PRI

10 REM ***VITEX93*******

20 REM ***BY ED KRIKORIAN***

COMPUTERS UNLIMITED (803) 877-0269

Before you buy somewhere else, give us a call!

	~ y ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	a carri
DATASOFT (4616)	Tape	Disk
Moon Shuttle (16K)	\$27.95	\$27.95
TOM MIX		
Donkey King (32K)	\$19.95	\$24.95
Space Shuttle (32K)	\$24.95	
Trap Fall (16K)	\$24.95	\$26.95
INTRACOLOR COMMUNICAT	TIONS	
Colorpede (16K)	\$26.95	\$29.95
Robottack (16K)	\$19.95	\$24.95
7477	ON (00K)	200 05
Specials ZAXX	UN (JZKJ -	\$29.95
PRINTERS	/ISK III - \$4	99.95
Okidata 82A		\$389.95
We also handle all other Ok	cidata produ	ucts!
C.ITOH Prowriter (Parallel)		
ACCESSORIES		
7.00000c		

Super-Pro Keyboard Kit \$62.95 We also carry TRS-80 Color Computers. This is just a partial list — call or write for catalog!! TERMS: Money order and your personal checks welcome. Shipping - \$2.00 for software, 2% for hardware. C.O.D. please add \$2.00 — S.C. residents add 4% sales tax. COMPUTERS UNLIMITED • RT. 7 JOHNSON ROAD GREER, S.C. 29651 • [803] 877-0269 9 a.m. to 9 p.m. E.S.T.

```
NT"4. HALT EXECUTION. ": PRINT"5. MO
VABLE OBJECTS. ": INPUT "YOUR CHOIC
11Ø IF D=5 THEN 77Ø
120 IF D=4 THEN PRINT"EXECUTION
HALTED. ": END
130 IF D>5 OR D<0 THEN PRINT "IN
VALID COMMAND":GOTO 100
14Ø PRINT
15Ø IF D=3 THEN 61Ø
160 IF D=2 THEN INPUT"WHICH SCRE
EN (1,2 OR 3=BOTH)";SW
170 IF SW=1 THEN SW=0:PMODE 4,1:
PCLS:GOTO 100
18Ø IF SW=2 THEN SW=Ø:PMODE 4,5:
PCLS:GOTO 100
190 IF SW=3 THEN SW=0:PMODE 4,1:
PCLS:PMODE 4,5:PCLS:GOTO 100
200 PRINT"DEGREES FROM HORIZONTA
L,":INPUT"HIT <ENTER> FOR LAST V
ALUE"; TS: IF TS=Ø THEN TR=TX ELSE
 TR=TS
210 TX=TR:PRINT
220 TR=PI/(180/TR)
230 PRINT"DEGREES FROM VERTICAL,
":INPUT"HIT <ENTER> FOR LAST VAL
UE"; TW: IF TW-Ø THEN TY=TU: PRINT:
GOTO 250 ELSE TY=PI/(180/TW)
24Ø TU=TY:PRINT
250 PRINT"OBJECT'S LOCATION OFFS
ET (X,Y)":INPUT"FROM CENTER OF S
CREEN"; XO. YO
26Ø PRINT
27Ø INPUT"OBJECT'S RADIUS";R
280 PRINT
29Ø INPUT"NUMBER OF SIDES";JJ:JJ
=PI/JJ*2
300 PRINT
310 PRINT"IF SAME OBJECT WITH DI
FFERENT": PRINT"ANGLE FROM HORIZO
NTAL IS WANTED": PRINT"ON SCREEN
2, ENTER ITS DEGREES, ": INPUT "OTH
ERWISE HIT (ENTER)";AT
32Ø PRINT
330 IF AT>0 THEN PRINT:PRINT"SEC
OND OBJECT'S DEGREES": INPUT"FROM
 VERTICAL"; TE: SF=1: AT=PI/(180/AT
):PA=1:IF TE=Ø THEN GOTO 37Ø ELS
E TE=PI/(18Ø/TE):GOTO 37Ø
34Ø INPUT"WHICH SCREEN (1 OR 2)"
350 IF PA=0 THEN PA=1
360 IF PA=2 THEN PA=5
370 PMODE 4,PA:SCREEN 1,0
38Ø POKE 65495,0: ****DELETE THIS
LINE IF YOUR SYSTEM DOES NOT HA
VE HIGH SPEED POKE**********
390 REM ***DRAWING ROUTINE****
400 NC=0
41Ø FOR CN=(Ø+TY) TO ((2*PI)+TY)
```



Michigan Residents Add 4% Sales Tax to Order Please include \$1.00 for \$ & H VISA & MASTERCARDS ACCEPTED

Electronic Calligrapher - The Hit of Rainbowfest.
Old English or Chancery Cursive
type font. Works with LP VIII or EQUIV.
Version for Gemini 10 or 15

Version for Epson w/Graftrax

BOTH TYPE FONTS \$18.95 DISK ONLY!

— ARCADÉ FU	JN —	•	
Packmaze	ML	16K	\$16.95
Bug Chase Ext		. 32K	\$15.55
One or two player or robot bug aga			
Donkey King			\$24.95
Moon Lander		. 16K	\$15.95
Dancin' Devil			\$14.95
War Kings			\$19.95
Spider			\$19.95
Cave Hunter			\$24.95
Haywire			\$24.95
Astro Blast			\$24.95
Colorpede	16K 1	ML T.	\$29.95
Rotoattack 1	6K I	ML T.	\$24.95

— HARDWARE –

Grand Slam Solderless Kit \$75.00

For E or F Board and 1.1 ROM Please include \$10.00 REFUNDABLE

tool deposit with order For All Boards RAM Slam Solderless Kit

16-32K \$49.95 15-minute installation

ONE YEAR WARRANTY

THE GENERAL

- EDUCATIONAL -

- EDUCATIONAL -		
Speller	16K	\$16.95
Geo-Studies	16K	\$ 9.95
USA, Canada, Europe, Aust.		
Word Drill	16K	\$19.95
Math Drill	16K	\$19.95
- ADVENTURES -		
Calixto Island 16K	ML	\$19.95
Black Sanctum 16K	ML	\$19.95

- UTILITIES -

Copy Cat	٠.							•								16K	ML	\$19	.95
Color DFT	• •	٠.	٠.	•	•	•	•	•	•	•			1	6	K	ML	ŢT.	\$19).95

— LITERATURE —

Assembly Language Graphics \$14.95 TRS-80 Color Computer Graphics \$14.95

RS 232 SWITCHER

Stop Straining Those Connectors.
Stop Listening to the Modem.
Stop Trying to Log on the Printer.
Fast, Fast, Relief the RS 232 Switcher.

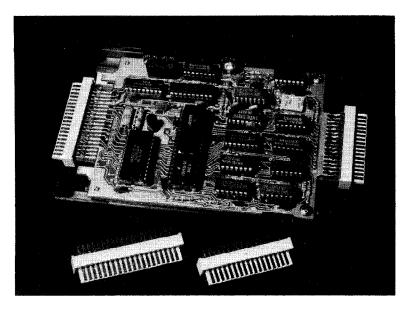
2 way \$29.95

3 way \$39.95

FOR THE COLOR COMPUTER AND TDP SYSTEM 100

ATTENTION DISK USERS

ARE YOU TIRED OF I/O ERRORS AND LOST DIRECTORY FAILURES



GOLD EDGE CONNECTORS

When these edge connectors are attached to the Color Computer/System 100 Disk controllers, the dreaded I/O error and lost directory failures may be virtually eliminated. These problems can be caused by oxidation of the tinned connectors on the disk controller; which can cause a poor electrical contact between the disk controller and the computer. The installation of these connectors DOES REQUIRE SOLDERING. THESE GOLD CONNECTORS ARE SOLDERED DIRECTLY TO THE EDGE CONNECTORS OF THE DISK CONTROLLER. INSTALLATION OF THESE CONNECTORS MAY VOID THE WARRANTY ON THE DISK CONTROLLER.

KIT INCLUDES TWO CONNECTORS AND COMPLETE INSTRUCTIONS FOR EASY INSTALLATION.

PRICE: \$ 17.95 + \$ 1.00 shipping (Installation not included)

* ASK YOUR DEALER ABOUT THEIR INSTALLATION SERVICES *



CUSTOM INSTALLATION (includes connectors) \$ 35.95 + \$ 4.00 return shipping

INSTALLATION AND UPS 2nd DAY SERVICE WITHIN 5 DAYS OF RECEIPT OF DISK CONTROLLER

BRANTEX, INC.
COLOR SOFTWARE SERVICES DIV.
P. O. Box 1708
Greenville, Texas 75401



TELEPHONE ORDERS (214) 454-3674 COD/VISA/MASTERCARD

Texas residents add 5% tax
Foreign orders add \$2 per order
QUANTITY DISCOUNTS AVAILABLE

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

GOLDLABEL™

BLANK CASSETTES



PREMIUM 5 SCREW SHELL
COMPUTER QUALITY

SATISFACTION GUARANTEED

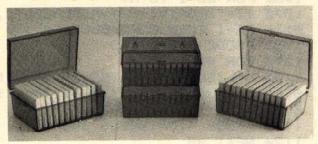
MADE IN U.S.A.
SCHOOL/CLUB DISCOUNTS

IF YOU ARE SERIOUS ABOUT SAVING PROGRAMS AND DATA ON TAPE, THEN "GO FOR THE GOLD"

1 dozen C 10 \$ 8.50 + \$ 2.50 shipping 2 dozen C-10 \$ 16.00 + \$ 3.50 shipping 1 dozen C-30 \$ 12.50 + \$ 2.50 shipping 2 dozen C-30 \$ 23.50 + \$ 3.50 shipping

INDIVIDUAL CASSETTE STORAGE BOXES (SOLD ONLY WITH CASSETTES) \$2.40 PER DOZEN

CASSETTE CADDY



HOLDS 12 CASSETTES
HINGED TOP
STACKABLE
EDGE LABELS INCLUDED



\$ 3.95 + \$ 2.00 shipping 2 for \$7.00 + \$ 2.50 shipping

FREE SHIPPING WHEN PURCHASED WITH CASSETTES

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.
P. O. Box 1708
Greenville, Texas 75401



TELEPHONE ORDERS (214) 454-3674 COD/VISA/MASTERCARD

Texas residents add 5% tax
Foreign orders add \$2 per order
QUANTITY DISCOUNTS AVAILABLE

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

STEP JJ 42Ø Y=INT(R*SIN(CN)) 43Ø X=INT(CX+(R*COS(CN))+SIN(TR) +XO> 44Ø Y=CY-((Y*SIN(TR))+YO) 450 PSET(X,Y,1) 460 IF CN<>0+TY THEN LINE(X,Y)-(OX, OY), PSET ELSE LX=X:LY=Y 47Ø IF D=Ø THEN 5ØØ 480 IF SF=0 THEN LINE(H(NC,0),H(NC, 1) > - (X, Y), PSET 490 IF SF=1 THEN LINE(AH(NC,0),A H(NC,1))-(X,Y), PSET 500 IF SF=0 THEN H(NC,0)=X:H(NC.1)=Y 510 IF SF=1 THEN AH(NC,0)=X:AH(N $C_{\bullet}(1)=Y$ 52Ø NC=NC+1 53Ø 0x=x:0Y=Y 54Ø NEXT CN 550 LINE(X,Y)-(LX,LY),PSET 56Ø POKE 65494,126: ****DELETE TH IS LINE IF YOUR SYSTEM DOES NOT HAVE HIGH SPEED POKE********* 570 IF SF=1 THEN PA=5:SF=0:TR=AT :TY=TE:GOTO 37Ø 58Ø IF QW=1 THEN RETURN 590 IF INKEY\$=" " THEN GOTO 100 **600 GOTO 590** 61Ø INPUT"VIEW SCREEN (1,2 OR 3= BOTH) "; HJ 62Ø IF HJ=Ø THEN HJ=1 63Ø IF HJ=2 THEN HJ=5 640 IF HJ=3 THEN 680 650 PMODE 4, HJ: SCREEN 1,0 66Ø IF INKEY\$<>" " THEN &6Ø 67Ø GOTO 1ØØ 68Ø PMODE 4,1:SCREEN 1,Ø 69Ø FOR HH=1 TO 25Ø 700 IF INKEY\$=" " THEN 100 71Ø NEXT HH 72Ø PMODE 4,5:SCREEN 1,Ø 73Ø FOR HH=1 TO 25Ø 74Ø IF INKEY\$=" " THEN 1ØØ 75Ø NEXT HH 76Ø GOTO 68Ø 770 ****MOVABLE OBJECT ROUTINE** 78Ø INPUT"NUMBER OF SUBGROUPS"; N 79Ø PRINT 800 IF NL>50 THEN PRINT"TOO MANY SUBGROUPS":GOTO 780 810 PMODE4,1:PCLS:PA=1:QW=1 820 FOR KE=1 TO NL 830 PRINT"SUBGROUP #"; KE; " OF "; NL 840 PRINT"MENU":PRINT"Ø.NEW OBJE CT. ": PRINT"1. CONNECT TO PREVIOUS OBJECT.":INPUT"YOUR CHOICE";L(K

85Ø PRINT 86Ø PRINT"OBJECTS OFFSET (X.Y)": INPUT"FROM CENTER OF SCREEN"; L(K E,\emptyset),L(KE,1) **87Ø PRINT** 880 INPUT"RADIUS OF OBJECT"; L(KE ,2) 89Ø PRINT 900 INPUT"NUMBER OF SIDES"; L(KE, 3):L(KE,3)=PI/L(KE,3)*2 91Ø PRINT 920 INPUT"DEGREES FROM HORIZONTA L"; TR: TR=PI/(180/TR):L(KE,5)=TR 93Ø PRINT 940 INPUT"DEGREES FROM VERTICAL" ;TU: IF TU=Ø THEN TY=Ø:L(KE,6)=Ø: PRINT:GOTO 95Ø ELSE TY=PI/(18Ø/T U):L(KE,6)=TY950 D=L(KE,4):JJ=L(KE,3):R=L(KE, 2):X0=L(KE,Ø):Y0=L(KE,1) 96Ø GOSUB 37Ø 970 A\$=INKEY\$:IF A\$<>" "THEN 970 98Ø NEXT KE 99Ø INPUT"NUMBER OF MOVEMENTS";N T 1000 INPUT DEGREES OF HORIZONTAL MOVEMENT"; DR 1010 INPUT"DEGREES OF VERTICAL M OVEMENT"; VR 1020 TR=0 1030 IF DR=0 THEN 1040 ELSE DR=P I/(18Ø/DR) 1040 QW=1:PA=5 1050 PCLS:PMODE 4,1:PCLS:SCREEN 1060 FOR BB=1 TO NT 1070 TZ=TZ+DR:VZ=VZ+VR:SCREEN 1, Ø: IF PA=1 THEN PA=5 ELSE PA=1 1080 PMODE 4, PA: PCLS 1090 FOR SS=1 TO NL 1100 D=L(SS,4):X0=L(SS,0):Y0=L(S S, 1): R=L(SS, 2): JJ=L(SS, 3): TR=L(SS, 3S,5)+TZ:TY=L(SS,6)+VZ1110 PMODE 4, PA: GOSUB 380 112Ø NEXT SS 113Ø NEXT BB 1140 SCREEN 1,0 1150 A\$=INKEY\$:IF A\$=" " THEN 90 ELSE GOTO 1150

Hint . . .

No-List POKE

If you would like to keep your program from listing, use *POKE* 383,158. To return to normal listing, type *POKE* 383,0.

-Ken Ostrer

E,4)



LUNAR-ROVER PATROL - Guide your Lunar Rover along the moon's surface following every bump and crevice as a barage of obstacles hinder your movement. No MOON-PATROL type features left out of this

WHIRLYBIRD RUN - Your mission is to reach and destroy the enemy base hidden deep within the Tunnel of Doom encountering missiles, saucers, and deadly gas clouds along the way. If you like SCRAMBLE, you will love WHIRLYBIRD RUN.

For Orders Only **1-800-426-1830**

except WA, AK, HI

Call or write for a complete catalog Business Office and Information Call: (206) 581-6938

Office open 8:30-4:30 P.S.T.

We accept VISA, MASTERCARD, AMERICAN EXPRESS. Add 3% for shipping, NO C.O.D. All prices U.S. FUNDS. WA residents add 7.8% sales tax.

SPECTRAL ASSOCIATES

3416 South 90th Street Tacoma, WA 98409

DEALER INQUIRIES INVITED

COCOFRO

COCOSLOTS

"as well done computerized one-armed bandit as I	can
imagine"JAN 1983 RAINBOW REVIEW	
ONLY	\$12.00

REVERSI

OTHELLO	"this	i 5	a	very	good	show	from
COCOPRO".	DEC	1982	RAI	NBOW R	EVĪEW		
CHEAP							\$12.00

FULL SCREEN EDITOR

Use arrow-keys control for editing of basic programs.

Much much more.

BARGAIN ------ \$15.00

COLOR DIRECTORY

This is the DIR command that you wish you had. Sorted DIR list with selection. Optional display to printer.

A	MUST		\$1	2.	Ø	Ø
---	------	--	-----	----	---	---

EXPANDED DIRECTORY

EXCHINDED DIRECTORY	
Save up to 120 files on one diskette.	
600D BUY	\$12.00

CASSETTE DIRECTORY

List program name, length, start, end and transfer address. Free with all orders if requested or send \$2.50 for program on cassette.

Above programs written in machine language for 16k. COCOSLOTS, REVERSI, CASSETTE DIRECTORY and FULL SCREEN EDITOR do not require EXTENDED BASIC!!! But are compatible with EXTENDED or DISK BASIC.

MASTER DIRECTORY

- # Master listing by diskette number with description.
- * Master listing of all your programs in either diskette or program sequence.
- # Basic for easy costomizing: fast mach lang sort
- # Requires 32k with printer

BEST SELLER ----- \$20.00

*** FREE CATALOG ***

Send self addressed stamped envelope.

Send check or money-order to: COCOPRO P.O. BOX 37022 ST LOUIS, MO 63141



Postage paid on pre-paid orders in continental U.S.. MO residents add 5.625% sales tax.

Hidden BASIC Is Pirates' Peeve

"Piracy" is much more common today than in the 16th century when the term originated. Whether it is an otherwise honest computer hobbyist sharing a good game with a friend, or a very dishonest dealer stocking his shelves with illegal copies, software piracy is a recognized industry-wide problem. The number of "doubloons" lost through illegal copying is enough to discourage many from entering the software market. This has forced software distributors into building copy protection into their products. There are coding techniques which offer a measure of protection for programs written in machine code, but there has been little copy protection available for programs written in Color Computer BASIC. The reason for this is simple. The philosophy behind the design of the BASIC operating system used in CoCo is that of simplicity, simplicity to the point of allowing accessibility to even a young child. In doing so, much flexibility with respect to copy protection is compromised.

Hidden BASIC 1.0 is a new tool marketed by Spectrum Projects which can help to protect a BASIC program from being copied. This is a machine language program that is appended to a BASIC program that you would like to protect. The resulting composite program, which is loaded as a machine language program, disables several commands normally found in BASIC. These are commands such as LIST, LLIST, CSAVE, CSAVEM, EDIT, CLOAD, CLOADM, and TRON and TROFF, which presumably could allow either direct duplication or listings of BASIC code which could be entered manually.

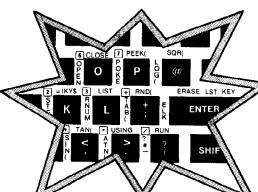
Hidden BASIC is very easy to use. It is loaded, the program to be protected is loaded, then the new program is saved automatically to tape. When loading, the protected program is treated as a machine language program, ie, CLOADM, but it is RUN not EXECuted. The protection provided for with this program is very effective.

Not mentioned in the advertising or the instructions, is that this program also appears to protect against copying with Disk BASIC. The SAVE, SAVEM, LOAD and LOADM commands do not work, therefore, a program cannot be taken apart by the add power allowed with the disk operating system. It is important to note that this program is sold only in a format designed to operate with cassette storage.

I recommend *Hidden BASIC* to anyone who has reason to protect a BASIC program. It is straightforward, easy to use, and works as advertised. There is the small matter of a royalty agreement with Spectrum Projects if you market a program using *Hidden BASIC* for protection. I called Spectrum to obtain details relating to royalty agreements on their "voice line," but only talked to a friendly tape recorder waiting to take my order. If you have any questions you should perhaps write or contact them via the data communications number given on the instruction sheet.

(Spectrum Projects, 93-15 86th Drive, Woodhaven, NY 11421, \$19.95 on cassette for BASIC or Extended Color BASIC)

- Fast Entry of Basic Programs
- Over 100 user definable keys
- Enhances all Coco's from 16K Non Extended Basic to Extended, 64K, Disk
- Available on Disk or cassette
- Built in cassette merge
- User's Support Service



"There are a number of products on the Coco market...the WORKSAVER ranks up there with the best of them"

-Rainbow Dec. '82

"...undoubtedly the best program I have ever bought for my color computer"

Color Computer News
Jan. '83

"the main function of the program seems to be making things easier and more functional for the user. It succeeds extremely well"

-Color Computer News

Jan. '83

THE WORKSAVER WILL SAVE YOU HOURS OF WORK...WRITING AND DEBUGGING YOUR PROGRAMS"

-Rainbow Dec. '82

FULL SCREEN EDITOR

"WANT TO CHANGE the line a couple lines up? Simple. Use the arrow keys to the appropriate place and make the change. This is not only a lot easier, but it is vastly faster, too...changing line numbers, joining lines together, breaking them apart, duplicating them elsewhere—heady stuff—is very easy to do with the Worksaver" (Rainbow)

DYNAMIC EDITING

This is one of our users' favorite features: When the computer halts due to an error, or you want to make an improvement while running, you can make changes without losing data: "This is a major plus in debugging...it can save a lot of time in data loads...(and) the generation of data through inputs."

Rainbow Dec.'82

"The things that this program add to the color computer...

INCREASE ITS CAPABILITIES MANIFOLD

...it should have been incorporated into the original MICROSOFT programming (or) given out with every color computer."

—Color Computer News Jan '83

THE PLATINUM WORKSAVER INCLUDES:

- Enhancement program, including a sample array editor on a high-quality Agfa cassette.
- Fully labeled acetate keyboard overlay, not a cheap stick-on.
 Complete instructions
- Loads in seconds, takes 2.2 K

WORKSAVER A1-A3 OWNERS:

Contact us regarding return policy for our New A-4 version.

The PLATINUM WORKSAVER costs \$35.00 plus \$3.00 S&H (NY residents add appropriate tax). To order write:

PLATINUM SOFTWARE P.O. Box 833 Plattsburgh, N.Y. 12901

Phone orders: (518) 643-2650 9-5 EST

VISA, MASTERCARD ACCEPTED. PERSONAL CHECKS TAKE 2-3 WEEKS TO PROCESS.

DYNAMIC INPUT

Perform numeric calculations, and check the contents of arrays and variables, WITHOUT interrupting the running of BASIC programs: "An EXTREMELY valuable feature that I use ALL the time."

—Color Computer News Jan. '83

NUMERIC KEYPAD CONVERSION

"The keys JKLUIOP are defined as the numbers 1-7, respectively...this mode is a Godsend for long data statements."

--Color Computer News Jan. '83

FULL FEATURED 4 COLOR KEYBOARD OVERLAY

"TRUTH: The WORKSAVER overlay is the best we have seen for this type of program." —The Rainbow Dec. '82

"A well designed keyboard overlay (NOT a sticker..."
—Color Computer News Jan.

COLOR COEPDHER

Spell-Rite Makes Cassette Spelling Right

As an adjunct to a cassette-based word processing system, Spell-Rite has so much promise that it could take up all your time for a month and still have untapped applications. Yet using Spell-Rite can be so frustrating that you'll want to chuck it out of the window after two hours.

The program, written by Darrel Wright and marketed by Eigen Systems of Austin, Tex., is a spelling verifier for text files. It is intended for use in a cassette system in conjunction with a word processing program that will generate ASCII files.

As shipped, Spell-Rite includes a ten thousand word dictionary that may be changed by addition or deletion. The program also allows the user to generate any number of specialized dictionaries, each containing up to 10,400 words. To a technical writer, that function alone would be worth the price of admission. The dictionaries are dynamic, in that each file checked can be used to add to the dictionary. In fact, Spell Rite can create new dictionaries merely by reading text files. The only limitations are that the words entered be between two and 18 characters long and contain no punctuation other than hyphens and apostrophes.



In use, Spell-Rite is strictly menu-driven, requiring one-key responses except when it asks for filenames. The machine language program returns to the main menu at any default, including a reset. The original purchase includes a backup copy just in case the first one crashes. The program carries a 90-day warranty as well. It requires 32K memory and Extended Color BASIC.

The user has four options on start-up. He may elect to get a hard copy of the program's actions, which records the line number, the word position, the questionable word and the action taken with it, or this can be displayed on screen as an option.

There is also a choice in verification mode. In the manual mode, the user must choose what to do with each questionable word—to correct it if it's not in the dictionary, to add it to the dictionary, or to ignore it. In the auto-verify mode, the computer merely indicates "Unsure" for each questionable word and goes on.

There's a catch to all this. The computer doesn't actually correct spelling. All it does is point out words that it doesn't have in its dictionary, leaving any correction up to the user. In effect, it's a typo-catcher rather than a spelling corrector. It's not a substitute for a good conventional dictionary.

Spell-Rite includes a host of other features, such as a way to bypass embedded codes or any other set of characters, a dictionary word count and sort and an index sorter that is actually a separate, bonus program.

I used Spell-Rite with Telewriter-64, after spending the better part of a day trying to figure out how to make the blasted thing save a file in ASCII format. As a last resort, I turned to the Telewriter manual and read the section that tells how to do it.

After saving several existing files in ASCII format, I loaded *Spell-Rite*, then followed its simple menus to load the basic dictionary that comes with it. Then I went to the menu to verify spelling and hit a very high frustration peak.

Spell-Rite works by reading in a line of text from the tape, checking each word in it against the dictionary, then loading another line. The cassette recorder starts and stops once for every line of text. My CoCo has a real fondness for the old I/O ERROR and is especially finicky about the start signal. Ergo, despite verifying the save with Telewriter, I was often shunted to the section of Spell-Rite that politely informed me that I had a tape error. After much gnashing of teeth and pounding the desktop, I managed to get a pretty good idea of what Spell-Rite is all about.

The cassette error problem is not a fault in *Spell-Rite*. It's a hardware problem that seems to be a fact of life with the relay that sends the start and stop signals to the cassette recorder. If that doesn't function correctly, *Spell-Rite* is useless.

I'm intrigued by *Spell-Rite*. It's well written, has very good documentation in the form of a 19-page manual and it has lots of room for experimentation. On the negative side, the program's reliance on the CoCo cassette relay gives it a vulnerability that can lead to frustration.

(Eigen Systems, P.O. Box 180006, Austin, TX 78718, \$59.95 on tape)

-Bruce L. Sublett

TRS-80C° and TDP 100° SPECIALISTS



COLORFORTH®

IS THERE LIFE AFTER BASIC? Yes! with COLORFORTH, a new, high level language for the color computer. COLORFORTH, a figFORTH compiler, has an execution time as much as 10 to 20 times faster than Basic, and can be programmed faster than Basic. COLORFORTH is highly modular for easy testing and debugging. COLORFORTH has been specially customized for the color computer and requires only 16K. It does not require Extended Basic. When you purchase COLORFORTH, you receive both cassette and RS/DISK versions, the figEDITOR and an extensive instruction manual. Both versions and 75 page manual, all for

PCFORTH

FORTH for the IBM PC and Zenith Z-100. All the features of COLORFORTH, but customized for the IBM and Zenith Z-100 personal computers. Requires 32K and MS/DOS or IBM/PCDOS. On 5-1/4" SSDD



MASTER MIXOLOGIST® The Bartenders' Guide

This disk based program for the color computer contains recipes for over 150 of your favorite bar drinksboth alcoholic and non-alcoholic. MASTER MIXOLOGIST is menu driven for ease of use. Requires 16K

ARMADILLO BUG® MACHINE LANGUAGE MONITOR

More and more programs are appearing in magazines written in Machine Language. Now with AR-MADILLO BUG, you can easily enter Machine Language programs without a lot of time consuming "pokes". ARMADILLO BUG is an excellent system for beginners to learn to write and debug their own Machine Language programs as well. This package includes: Memory examine and change: Move: Punch and Load; Fill commands; and more! Runs in 16K, and DOES NOT require Extended Basic. Com-

COLOR BIORHYTHMS

This is a neat BIORHYTHMS program you can use to chart the future (or past). Includes High Resolution araphics without Extended Basic being required. Runs in 16K. On cassette, with instructions \$ 10.95

OTHER ITEMS OF INTEREST

"STARTING FORTH", a book by Leo Brodie. The best introductory Forth text available. 384 pages.

fiaFORTH Installation Manual. Contains FORTH model, glossary, memory map, and figFORTH 6809 Source Listing. (NOTE: THIS IS NOT IDENTICAL TO COLORFORTH SOURCE). Requires installation manual for implementation \$ 15.00 "Computers Piss Me Off". Wear the official programmers badge. Large 2-1/4" yellow button says It all!

My Color Computer". White button with black lettering and red heart. 2-1/4". DEALER and AUTHOR INQUIRES INVITED

Please add \$ 2.00 shipping in U.S.

Foreign orders must be in U.S. funds drawn on U.S. banks, or Mastercard and VISA

ARMADILLO INT'L SOFTWARE

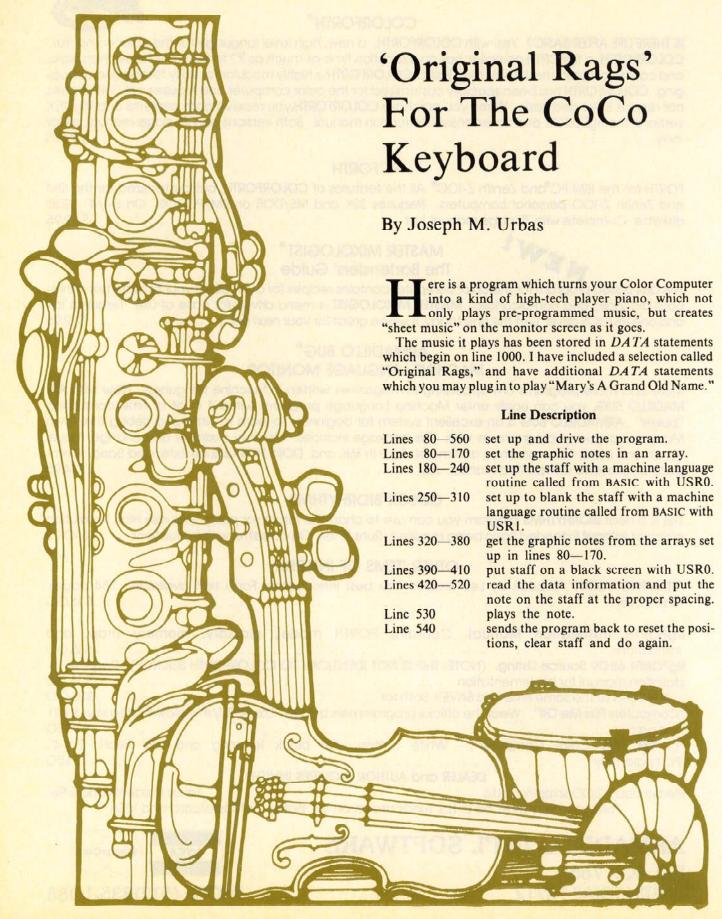
P.O. BOX 7661 **AUSTIN.TEXAS 78712**





PHONE (512)835-1088





Line 550 is a timer between notes to offset the time it takes to clear the staff.

Line 560 clears the staff at the end of the music.

Lines 570—590 do again.

For each note played, data is put into *DATA* statements in groups of three. . .

1) Graphic note (1-7)

2) Vertical position of the note (73—112)

3) Audio note (A-,A,B-,B,C,C+,D,E-,E,F,F+G)

Graphic Notes Vertical Positions 1) Half note, stem up. 73--B 2) Quarter note, stem up. 76--A----3) Sixteenth note, stem up. 79--G 4) Half note, stem down. 82--F-5) Quarter note, stem down. 85--E 6) Sixteenth note, stem down. 88--D-7) Whole note. 91--C 94--B----97--A 100--G---103--F 106--E-----109--D

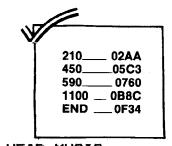
Audio Notes

They work exactly like the *PLAY* statement for the Color Computer with Extended Color BASIC.

112--C---

Hints

- •After your musical selection has been entered into your *DATA* statements, add ,8,8,8 to the end of the last *DATA* statement. This will end your musical selection.
- Keep your *DATA* statements short to make it easier to find a mistake when you make one.
- •Sheet music makes putting musical selections in fairly easy.
- •The graphic notes are for visual effect, so dotted notes are ignored but use the proper audio note length.
- •Start your *DATA* statements with line 1000, so as not to interfere with the driver portion of the program.
 - Take a little time to study my DATA statement lines.



The listing:

```
10),F(10),G(10):CLS
100 PMODE4,1:PCLS
110 CIRCLE(4,14),4,,.75:LINE(8,1
4) - (8, \emptyset), PSET
120 CIRCLE(19,14),4,,.75:PAINT(1
9,14),5,5:LINE(23,14)-(23,0).PSE
13Ø CIRCLE(34,14),4,,.75:PAINT(3
4,14),5,5:LINE(38,14)-(38,Ø),PSE
T:LINE(38,\emptyset)-(44,3),PSET
14Ø CIRCLE(49,14),4,,.75:LINE(45
,14)-(45,28),PSET
150 CIRCLE(64,14),4,,.75:PAINT(6
4,14),5,5:LINE(6Ø,14)-(6Ø,28),PS
16Ø CIRCLE(79,14),4,,.75:PAINT(7
9,14),5,5:LINE(75,14)-(75,28),PS
ET:LINE(75,28)-(81,25),PSET
17Ø CIRCLE(94,14),4,,.75
180 FORL=16000TO16052
19Ø READC
200 POKEL,C
21Ø NEXTL
22Ø DEFUSRØ=16ØØØ
23Ø DATA134,255,142,18,1,167,128
, 140, 18, 31, 38, 249, 142, 18, 193, 167
, 128, 140, 18, 223, 38, 249, 142
24Ø DATA19,129,167,128,14Ø,19,15
9, 38, 249, 142, 20, 65, 167, 128, 140, 2
Ø, 95, 38, 249, 142, 21, 1, 167, 128, 14Ø
,21,31,38,249,57
25Ø FORL=15937T015999
26Ø READC
27Ø POKEL,C
28Ø NEXTL
29Ø DEFUSR1=15937
300 DATA134,0,142,15,1,167,128,1
40, 18, 0, 38, 249, 142, 18, 33, 167, 128
, 140, 18, 192, 38, 249, 142, 18, 225, 16
7,128,140,19,128,38,249
31Ø DATA142,19,161,167,128,140,2
Ø, 64, 38, 249, 142, 2Ø, 97, 167, 128, 14
0,21,0,38,249,142,21,33,167,128,
140,22,160,38,249,57
320 GET(0,0)-(14,28),A,G
33Ø GET(15,Ø)-(29,28),B,G
34Ø GET(3Ø,Ø)-(44,28),C,G
35Ø GET(45,Ø)-(59,28),D,G
360 GET(60,0)-(74,28),E,G
37Ø GET(75,Ø)-(89,28),F,G
380 GET(90,0)-(104,28),G,G
390 PMODE4,1:PCLS:SCREEN1,1
400 A=USR(0)
410 FORM=1T0500:NEXTM
42Ø Q=Ø:P=2Ø
430 B=USR1(Ø)
440 READN, V, N$
450 ON N GOTO460,470,480,490,500
,510,520,560
46Ø PUT(P,V)-(P+14,V+28),A,OR:Q=
```

219

54: GOTO53Ø 47Ø PUT(P,V)-(P+14,V+28),B,OR:Q= 36:GDT053Ø 48Ø PUT(P,V)-(P+14,V+28),C,OR:Q= 18:GOT053Ø 49Ø PUT(P,V)-(P+14,V+28),D,OR:Q= 54:GOTO53Ø 500 PUT(P,V)-(P+14,V+28),E,OR:Q= 36: GOT053Ø 51Ø PUT(P,V)-(P+14,V+28),F,OR:Q= 18:GOT053Ø 52Ø PUT(P,V)-(P+14,V+28),G,OR:Q= 72: GOT053Ø 53Ø PLAYN\$ 54Ø P=P+Q:IFP=>236G0T042Ø 550 FORM=1T010:NEXTM:GOT0440 560 B=USR1(0):FORM=1T01000:NEXTM :CLS 57Ø PRINT@259, "PRESS ENTER TO PL AY AGAIN." 58Ø IF INKEY\$<>CHR\$(13)GOTO58Ø 590 RUN 1000 '****ORIGINAL RAGS**** 1010 DATA6,88,T504L8D,6,100,03G, 6,94,B,5,88,04L4D,6,94,03L8B,6,8 8,04D,6,94,03B,6,88,04D,6,100,03 G, 6, 94, B, 5, 88, O4L4D, 6, 94, O3L8B 1020 DATA6,88,04D,6,94,03B,6,85, O4E, 5, 85, L4E, 3, 100, O3L8G, 3, 97, A, 3,100,G,2,97,L4A,4,94,L2BP8,6,10 Ø,L8G,6,94,B,6,91,04C 1030 DATA6,88,04L8D,6,100,03G,6, 94, B, 5, 88, O4L4D, 6, 94, O3L8B, 6, 88, 04D, 6, 94, 03B, 6, 88, 04D, 6, 100, 03G, 6,94,B,5,88,04L4D,6,94,03L8B 1040 DATA6,88,04D,6,94,03B,6,94, L4B, 1, 97, L2A, 3, 100, L8G+, 3, 97, A, 6 ,94,B,2,97,L4A,3,1Ø3,L8F+,2,1Ø6, L4E, 2, 109, D 1050 DATA6,88,04L8D,6,100,03G,6, 94,B,5,88,04L4D,6,94,03L8B,6,88, O4D, 6, 94, O3B, 6, 88, O4D, 6, 100, O3G, 6,94,B,5,88,04L4D,6,94,03L8B 1060 DATA6,88,04D,6,94,03B,6,85, 04E, 6, 85, L4E, 3, 1ØØ, O3L8G, 3, 97, A, 3,100,G,3,97,L4A,4,94,L2.B,5,94, L4B 1070 DATA6,85,04L8E,5,88,L4D,6,9 4,03L8B,5,91,04L4C,5,94,03B,6,94 ,L8B,2,97,L4A,3,1Ø6,L8E,5,94,L4B 1080 DATA2,97,A,6,94,L8B,2,97,L4 A, 6, 94, L8B, 6, 91, 04C, 6, 94, 03B, 2, 9 7,L4A,1,1ØØ,L2G,5,79,O4L4GP4 1090 DATA6,76,04L8A+,5,73,L4B,6, 76,L8A+,5,73,L4B,6,76,L8A+,6,73, B, 6, 82, F+, 5, 79, L4G, 4, 85, L2E, 6, 82 ,L8F+ 1100 DATA5,79,L4G,6,82,L8F+,5,79 ,L4G,6,82,L8F+,6,79,G,6,91,C+,5,

111Ø DATA6,91,04L8C+,5,88,L4D,6, 91,L8C+,5,88,L4D,6,91,L8C+,6,88, D, 6, 88, D+, 5, 85, L4E, 1, 97, O3L2A, 6, 88,04L8D+ 112Ø DATA5,85,L4E,6,88,L8D+,5,85 ,L4E,6,88,L8D+,6,85,E,6,85,E+,5, 82,L4F+,4,88,L3.D 113Ø DATA6,76,04L8A+,5,73,L4B,6, 76,L8A+,5,73,L4B,6,76,L8A+,6,73, B, 6, 82, F+, 5, 79, L4G, 4, 85, L3E 114Ø DATA6,82,L8F+,5,79,L4G,6,82 ,L8F+,5,79,L4G,6,82,L8F+,6,79,G, 6,91,C+,5,88,L4D,1,94,O3L3B 1150 DATA3,97,03L8A,2,97,L4A,3,9 7, L8A, 5, 85, O4L4E, 5, 85, E, 6, 88, L8D ,5,79,L4G,6,85,L8E,6,88,D 1160 DATA6,94,03B,2,100,L4G,6,97 ,L8A,6,94,B,6,91,04C,5,94,03L4B, 3,100,L8G,2,97,L4A,7,100,L2GP4 117Ø DATA6,88,04L8D,6,100,03G,6, 94,B,5,88,04L4D,6,94,03L8B,6,88, O4D, 6, 94, O3B, 6, 88, O4D, 6, 100, O3G, 6,94,B,5,88,04L4D 118Ø DATA6,94,03L8B,6,88,04D,6,9 4,03B,6,85,04E,5,85,L4E,3,100,03 L8G, 3, 97, A, 3, 100, G, 2, 97, L4A, 4, 94 ,L2.B,5,94,L4B 119Ø DATA6,85,04L8E,5,88,L4D,6,9 4,03L8B,5,91,04L4C,5,94,03B,6,94 ,L8B,2,97,L4A,3,106,L8E,5,94,L4B 1200 DATA2,97,A,6,94,L8B,2,97,L4 A, 6, 94, L8B, 6, 91, 04C, 6, 94, 03B, 2, 9

Mary's A Grand Old Name

1000 'MARY'S A GRAND OLD NAME 1010 DATA3,109,T403L16D,3,100,L8 .G,6,94,L16B,4,88,O4L2D,4,94,O3B ,1,97,A,1,106,E,3,103,L8.F+,3,10 Ø,L16G,3,97,L8.A,3,1Ø3,L16F+,2,1 Ø9,L4D,2,1Ø3,F+,1,1Ø6,L2.E,3,1Ø9 ,L16D,3,106,L8.E,3,103,L16F+ 1020 DATA2,97,L4A,2,100,G,2,103, F+, 2, 106, E, 2, 103, F+, 2, 100, G, 2, 97 ,A,2,109,D,1,97,L2A,1,97,A+,4,94 ,L2.B,3,109,L16D,3,100,L8.G,6,94 ,L16B,4,88,O4L2D,4,94,O3B 1030 DATA1,97,A,1,106,E,3,103,L8 .F+,3,100,L16G,3,97,L8.A,3,103,L 16F+, 2, 109, L4D, 2, 103, F+, 1, 106, L2 .E, 3, 109, L16D, 3, 100, L8.G, 6, 94, L1 6B,5,88,04L4D,5,88,D+,5,85,L4.E, 6,94,03L8B 1040 DATA5,85,04L4E,5,88,D,5,91, C, 6, 94, 03L8. B, 3, 97, L16A, 1, 106, L2 .E,1,103,F+,1,100,L2..GP4,8,8,8

7,L4A,1,100,L2G,5,79,04GP4,8,8,8

88,L4D,4,94,03L3.B

TMTA

NOW ... The worksheet calculator program you've been waiting for is waiting to work for you. ELITE • CALC™ is a powerful, full featured worksheet calculator designed especially for the Color Computer. Answer "what if" questions, prepare reports,

maintain records and perform other tasks that, until now, required sophisticated business computers. ELITE • CALC™ is a serious tool for those who want to do more than play games with their Color Computer.

SGN.

Features include:

- Single character commands
- Help Displays
- Enter text or formulas to 255 characters long
- Repeat text entries
- 255 maximum rows
- 255 maximum columns
- Available memory always displayed
- Rapid Entry modes for text and data
- Selectable Automatic Cursor movement
- Insert, Delete, Move entire rows or columns
- Replicate one cell to fill a row or column with selectable formula adjustment
- All machine language for speed
- Extended BASIC required for ROM routine calls
- Automatic memory size detection for 16K, 32K or 64K
- > 20K bytes, storage available in 32K systems
- BASIC style formulas
- Math Operators: +, -, X,/,↑,(,), =
- Relation Operators: =,>,<,<=,>=,<>
- Logic Operations: AND, OR, NOT
- Conditional Formula: IF ... THEN ... ELSE
- Trig Functions: SIN, COS, TAN,

- ★ Easy to use
- ★ Individual cell formulas
- ★ Copy blocks of cells
- ★ Full cell-edit capability
- ★ Compatible with all printers
- ★ Graph format for bar charts
- ★ Sort in ascending or descending
- ★ Comprehensive manual included

Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP

. Log Functions: LOG, EXP, SQR.

Misc. Functions: INT, FX, ABS,

- Nine digit precision
- Definable constant table
- User definable printer set-up commands
- Individual column width settings
- Adjustable row height to insert blank lines without wasting memory
- Hide colmns or rows
- Alternate print font selectable on cell by cell basis
- Display/Print formats set by cell, row, or column
- Dollar format, comma grouping; prefix or postfix sign
- Scientific notation, fixed point and integer formats
- Left and Right cell contents justification
- Full page formatting
- All formats stored with worksheet on disk(tape)
- Save & Load Disk(tape) files in compact memory form
- Scan disk directories
- Output ASCII file for word processor input compatibility
- Memory resident code ... no repeated disk calls Sample worksheets included

"Truly one of the best programs I have seen." John Steiner, Micro

THE BEST FOR ONLY

Disk or Tape

- Shipping from stock NOW
- Dealer Inquiries Invited. Add \$2 Postage & Handling PA residents add 6% sales tax

"Elite• Calc is a great spreadsheet program!" Stuart Hawkinson, Rainbow

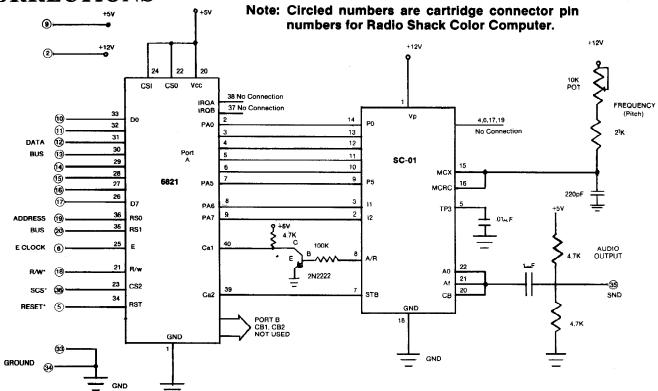




Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

From the creators of: ZAKSUND COLOR TEXTSET I COLOR TEXTSET INTER-GALACTIC FORCE . TEXT EDITOR . PARTY PAK . COLOR MONITOR TREK-16 WARKINGS DISK & TAPE COPY • ANIMALS • BODY PARTS • TAPE COPY and many other fine programs

CORRECTIONS



In John R. Kelty's "A Cheap Talker For Our CoCo" (July 1983, page 276), the accompanying schematic had a few errors. Writes Kelty, "Most readers would notice the pin errors on the 6821. It would not really matter if these were reversed anyway, except that the inflections would be inverted and the speech might sound like Chinese." Check pins 8 and 9 on the revised schematic and also note that the

4.7K ohm resistor at CA1 should be "pulled up," +5VDC (not +3). The series resistor with the 10K pot is 2K and, finally, the clock capacitor of 220 pF to ground was left off. We had a number of calls about these mistakes and regret any inconvenience they caused. The corrected schematic is reproduced for your reference.

Submitting Material To the Rainbow

Contributions to the RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary, explaining how the program works. We're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should so state when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, the RAINBOW, P.O. Box 209, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

Apparently due to an error in paste-up at the Rainbow, the first segment of line 10 was left out of the listing for Mike Hall's "Trailin' Tail" (August 1983, page 36). That line, in its entirety, is:

10 CLS:DIMCH\$(43),X(99),Y(99),A(4),B(4),E(10),S(11),S\$(11),G(50):FORZ=1TO43:READCH\$(Z):PLAY"L255;ABA":NEXT:FORZ=1TO10:S(Z)=0:S\$(Z)="":NEXT"

Joel Robbins reports that in his Autodesigner listing in "Talk About Your Chopped Down Ford!" (August 1983, page 50), there "were some 'ghosts' from an earlier version that didn't affect the running of the program, but might appear as real mysteries because they are useless commands." To "clean up" the listing, delete lines 103, 106, 107, 122 and 123. Change line 121 to read: 121 RETURN and that should do it.

Ken Ostrer's "Treasures of the Enrakian Empire," (August 1983, page 122), needs a *POKE 25,6: NEW* prior to loading in order to free up enough memory. We apologize for not noting this in the article.

Don't ask us how it happened, but a colon was omitted from the end of a line in the listing for Jim Schmidt's "Everything You Wanted To Know About Hex..." (April 1983, page 186). Line 16030 should properly read:

16030 N1\$=HEX\$(N1):N2\$=HEX\$(N2): A1\$=HEX\$(N1-N2)



ewriter the Color Computer Word Processor

- **3** display formats: 51/64/85 columns \times 24 lines
- **■** True lower case characters
- User-friendly full-screen editor
- Right justification
- **Easy hyphenation**
- Drives any printer
- Embedded format and control codes
- Runs in 16K, 32K, or 64K
- Menu-driven disk and cassette I/O
- No hardware modifications required

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with true lower case characters. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

.. one of the best programs for the Color Computer I have seen...

Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional highdensity displays: 64×24 and $85 \times 24!!$ Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51×24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, all on the screen at one time. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona. Terminct, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dotgraphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette autoretry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

...truly a state of the art word processor... outstanding in every respect.

The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The stepby-step tutorial will have your writing with Telewriter-64 in a matter of minutes.) To order, send check or money order to:

Cognitec 704 Nob Street Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add \$2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

RECEIVED & CERTIFIED

The following products have been recently received by the Rainbow, examined by our magazine staff and approved for the Rainbow Seal of Certification, your assurance that we have seen the product and have ascertained that it is what it purports to be.

This month the Seal of Certification has been issued to:

Time Teacher, a 16K ECB educational program for ages 5-11 with six skill levels. It reinforces and assists children in learning to tell time by having them convert the time displayed on a traditional clock into digits using the keyboard. Includes two practice modes, two quiz modes and a detailed progress report with the student's name that can be displayed to screen or printer. Crystal Software, 6591 Dawsey Road, Rock Creek, OH 44084, tape \$15.95.

Trekbest, a 16K ECB Trek game. Objective: You are in command of a prototype destroyer with the mission of stopping the Klystar from successfully invading your home space. Hyperion Software, P.O. Box 196, Lagrangeville, NY 12540, tape \$16.95.

Babylon, a 16K game with ten skill levels. Objective: You are governor of Babylon and in the best interest of its citizens, you must manage the city's assets; land, grain, and the people themselves (as sources for farmers and as members of the city's defensive army) while contending with enemy invasion, poor crops, plague, and other disasters that arise. Valhalla Enterprises, P.O. Box 243, Sumner, WA 98390, tape \$12.50.

Electronic Graph, a 16K ECB function graphing program that will graph any function using low, medium or high-resolution graphics and overlay as many of the functions on a graph as you wish using a LPVII or look-alike printer. Valhalla Enterprises, P.O. Box 243, Sumner, WA 98390, tape \$14.56.

Great New Adventures In Wonderland, a 32K 100 percent ML adventure, fantasy world game peopled with the creatures of Lewis Carroll's magination, "Alice In Wonderland," "Through The Looking Glass," and "The Hunting of the Snark" blended into one landscape. Objective: You are Alice. As you wander through Wonderland, you must become a queen (on the chessboard landscape), help capture the nasty Snark, and get home again. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, tape \$24.95, disk \$29.95.

TIMSMAIL, Tape Information Management Systems Mailing List, a 16K Extended BASIC modification of TIMS (a generalized data management system) to address the special requirements of label printing that cannot be handled by the more generalized TIMS print mode. TIMSMAIL provides eight fields selected in such a way as to facilitate searching, editing, sorting and printing the mailing list. Includes a 15-page user manual. Sugar Software, 2153 Leah Lane, Reynoldsburg, OH 43068, tape \$19.95.

Shaft, a 16K 100 percent ML arcade game. Objective: Maneuver your man across the screen while avoiding the eight crushing elevators, as they move up and down in one of several random patterns, and try to reach the next floor. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, tape \$24.95, disk \$29.95.

Topsy Turvy, a 16K ECB educational word game for one to six players. Objective: Play against your opponent and form as many three or more letter words as you can from the ten letters chosen at random by the computer. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, tape \$19.95, disk \$24.95.

Disk Manager, a 16/32K disk utility program that provides all the facilities needed to manage disk files. It will date files on the disk directory; print a directory that includes file size; creation date; granule locations; and machine language program start, end, and exec locations. Disk Manager will also create and save a catalog of all the files on a collection of disks, find a particular file or group of files in the catalog, restore killed files, completely recover a disk with a damaged directory and most output from the program car be sent to the screen, printer or both. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, tape \$29.95.

Music Box, a 16K ML program that lets you compose (or type in from sheet music) a song in four-part harmony, assign a different instrument to each voice, or use one instrument for several parts. Includes a song by Bach and instructions. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, tape \$24.95, disk \$29.95.

Disk Zapper, a 32/64K programmer's aid, disk-fixer, editor and formatting utility. It can be used to protect disks, change the information on disks, and backup many disks that have been altered to make backup impossible. Prickly-Pear Software, 9234 E. 30th Street, Tucson, AZ 85710, disk \$34.95.

CoCo Mail, a 16K menu oriented, mailing list system to be used to maintain a list of up to 200 files per disk, containing name, address, city, state, zip, phone numbers, special code, and notes with a maximum of 256 characters per file. The special codes record of each file allows the system user to mark each record for specialized printouts. Files can be moved from one disk to another and prints two across or single labels. Includes a 15-page instruction manual. Reitz Computer and Electronics, 3170 W. Central Avenue, Toledo, OH 43606, disk \$59.95.

Graphic Screen Print Program, a 16K ML graphic screen print program that works in all PMODES and lets you shift screen images anywhere on the printed page. Available for both Color BASIC 1.0 and 1.1. Custom Software Engineering, 807 Minutemen Causeway, Cocoa Beach, FL 32931, tape \$9.95.

Statement Writer, a 32K program that supplements the capabilities of the Disk Double Entry (DDE) program and allows you to select certain DDE accounts for special treatment, add supplemental information and format the ledgers for these accounts to satisfy special needs. The program will take receivable accounts, add full customer name and address, and produce statements suitable for billing. Statement Writer will also produce summary reports for selected accounts to provide overall visibility of account status and activity. The user should be familiar with the concepts and operation of DDE before attempting to use this program. Custom Software Engineering, 807 Minutemen Causeway, Cocoa Beach, FL 32931, tape \$34.95.

Data-500, a 16K menu-driven data base utility program that will store up to 3,000 characters on one file and print to screen or printer. Litefrac Software, Inc., 2002 N. Magnolia, Tuscon, AZ 85712, tape \$12.

Cosmic Clones, a 16K ML arcade war game. Objective: Achieve the highest score possible by eliminating the Clonial invasion forces while protecting your starbase fuel cells. Mark Data Products, 24001 Alicia Parkway, No. 226, Mission Viejo, CA 92691, tape \$24.95.

El Bandito, a 16K ML game for one or two players with eight skill levels. Objective: Maneuver your bandits through passages and into tunnels while dodging menacing spiders and returning bounty to your lair. Mark Data Products, 24001 Alicia Parkway, No. 226, Mission Viejo, CA 92691, tape \$24.95.

Flexi-Filer, a 32K data base management system for applications such as mailing lists, inventory, sales records, expense records, etc., with many features that allow you to customize the system. Flexi-Filer will collect up to 35 elements per record, with up to 240 characters per record. All or any selected subset or records can be sorted in ascending or descending order by any of the 35 fields. Includes a 32-page instruction manual and requires an 80 column printer. Computerware, Box 668, Encinitas, CA 92024, disk \$64.95.

Micromon, a 4K ML monitor designed to allow direct access to the 6803 microprocessor, the heart of the Radio Shack TRS-80, Model MC-10. It contains the necessary tools to: examine the contents of the MC-10 operating system ROM and discover many of the routines contained therein; examine and change contents of memory in RAM based programs; save and load ML programs using cassette tape; create your own ML programs; use breakpoints and register displays for debugging and testing ML programs, routines; and dumps listings or memory contents to printer for hardcopy recording. Includes a 9-page instruction manual. Micro Ten Software Company, 495 Amboy Avenue, Perth Amboy, NJ 08861, tape \$19.95.

Spelling Bee, a 16K ECB word game for one or two players of ages seven to adult, using high-resolution animated graphics. Objective: Help Kay Bee find the letters that make up the word hidden in the flower by inputting letters using the keyboard. The game comes complete with a file of 260 words, three game variations and two skill levels. Players can also vary the difficulty by creating word lists that can be saved on tape. Crystal Software, 6591 Dawsey Road, Rock Creek, OH 44084, tape \$15.95.

Mathmenu, a 16/32K menu-driven system turns your CoCo into a flexible tool for mathematics and engineering by manipulating matrices and vectors, performing integration and differentiation, solving quadratic equations, and plotting user defined functions. Includes a 22-page reference manual. Inter Action, 113 Ward Street, Department F, New Haven, CT 06519, tape \$44.95, disk \$49.95.

Bumpers, a 16K ML maze game for one or two players. Objective: Race your opponent through a randomly generated maze with invisible walls, (until the player hits them) while avoiding booby traps and setting new traps for your opponent, as you try to be the first to complete the maze. Mark Data Products, 24001 Alicia Parkway, No. 226, Mission Viejo, CA 92691, tape \$24.95.

Glaxxons, a 16K super hi-res, ML space game for one or two players with seven skill levels. Objective: Achieve the highest score by eliminating as many swooping and diving, enemy attacking space crafts as possible, while avoiding your own destruction. Mark Data Products, 24001 Alicia Parkway, No. 226, Mission Viejo, CA 92691, tape \$24.95.

Recall, a 16K utility program that will recover material lost to the I/O ERROR in a cassette crash. It recovers both BASIC and machine language. Time Software, P.O. Box 1014, Clearfield, VT 84015, tape \$14.95.

Disk Graphics, a 16K ECB program that allows you to plot a variety of charts and display them on a screen or print them on a graphics printer. With its multifaceted, chart-plotting capabilities, Disk Graphics has many practical, business, scientific, and engineering applications. Radio Shack Stores nationwide, disk \$49.95.

Amortization, a 16K ECB program designed to provide you with complete information concerning simple interest loans. The program will print the following on the screen or printer: a running total of principal still to be paid; amount of monthly payment applied to the principal balance; amount of monthly payment applied to interest; the total monthly payment; the total amount paid into principal to date; the total of interest paid to date; and the total amount paid to date. Harmonycs, P.O. Box 1573, Salt Lake City, UT 84110, tape \$11.95.

C.C. Dialer, a 16K automatic telephone dialing program that outputs telephone digits through your television speaker. You can enter and save directories on tape and each directory will contain up to 196 names and numbers. Requires ECB and touch-tone phone service. Chris Computers, 6299 Alderwood Lane, Delta, B.C., Canada V4E 3E7, tape \$29.95.

The Cheap Talker, a 16/32K ECB speech synthesis system that comes fully assembled and tested. Includes cartridge with socketed SC-01, program and users manual. Kelty Engineering, 1440 N. 61st, Lincoln, NE 68505, tape \$80. Printed circuit board for Cheap Talker \$15.

INTBASIC 1.0, a 16/32/64K interactive, self-contained integer BASIC compiler. The compiler was designed to optimize program space and memory requirements, while still maintaining syntax structures used in Color Basic. INTBASIC 1.0 breaks a BASIC program into three areas within memory, with the variable storage area occupying the fourth. The four areas of memory are used for: main program storage, text table storage (print text), subroutine storage and variable storage. Wasatchware, P.O. Box 510371, Salt Lake City, UT 84151, tape \$39.95.

Zeus, a 16K ML arcade game. Objective: You are the mighty wizard and you must fight off the thunderbolts from the Thunder God—Zeus. As the Cone of Cold destroys the thunderbolts, you must use your shield for protection. Aardvark, L.T.D., 2352 S. Commerce, Walled Lake, MI 48088, tape \$19.95.

Cassette Directory, a 4K program that will read a tape cassette and print a directory of each file found on the cassette. CoCoPro, P.O. Box 37022, St. Louis, MO 63141, tape \$2.50.

Graphic Math Adventure, a 32K ECB educational adventure game in 24 skill levels. Objective: Search for treasure on land, river and in caves. Your search is blocked by many obstacles which can be overcome by correctly answering math problems of addition, subtraction, multiplication and division. Software Factory, 1333 Morgan Road, Bremerton, WA 98312, tape \$21.95.

Statgraf, a 32K ECB, menu-driven, linear regression analysis package combined with a high resolution plotting/line graphing system. The user can enter pairs of data points (either from the keyboard, tape or disk), edit the data, obtain a table of statistics, and plot the original or transformed data in a variety of user defined configurations. Includes a 40-page users manual. Sugar Software, 2153 Leah Lane, Reynoldsburg, OH 43068, tape \$24.95.

Fury, a 32K talking war game. Objective: you are the sole defender of your homeland. As the Communists move in you must shoot down airplanes, helicopters, hot air balloons, parachutes and magnetic air mines while waiting for the CIA backup to arrive. Computer Shack, 1691 Eason, Pontiac, MI 48054, disk \$29.95.

Colorcopy, a 32K menu-driven copy utility that copies data files or programs: disk to tape, tape to disk or disk to disk. It also kills files or programs. CoCoPro, P.O. Box 37022, St. Louis, MO 63141, tape \$15.

Payout, a 16K/32K accounts payable system written for the Radio Shack Color Computer and the Line Printer VII. Sector Software, 17 Waynewood Drive, Dartmouth, Nova Scotia, Canada B2W 1G1, tape \$29.95.

Payup, a 16K/32K accounts receivable system written for the Radio Shack Color Computer and the Line Printer VII. Sector Software, 17 Waynewood Drive, Dartmouth, Nova Scotia, Canada B2W 1G1, tape \$29.95.

Database Mailer/Letter Writer, two programs — a database mailer and a two-part letter writing program, both designed to create, maintain and utilize stored information for 16K and 32K tape or disk systems. The first part of Letter Writer will help you create and edit a letter file and the second part will allow you to print using your letter file and to merge with Database Mailer program. Includes a 36-page user's manual. EVS System Engineering Company, 9528 Miramar Road, Suite 35, San Diego, CA 92126, tape or disk \$49.95.

The Seal of Certification program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in the Rainbow. By awarding a Seal, the magazine certifies the program does exist, but this does not constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to the Rainbow's reviewers for evaluation.



FOR SUPERIES By Jeff Pyne

Here's a conversion program that will bridge the measurement gap and tell you how wide it is in both feet and meters.

5"

id you ever want to run in a 16 kilometer race, but decided not to because you weren't sure if you could run that far? Or perhaps you have needed to figure out how many liters of gas are required to fill a 10 gallon tank? Well, here is a program written by Jeff Pyne that will help you solve your problems. Convert is a useful program that makes it easy to convert inches to millimeters, inches to centimeters, feet to meters, miles to kilometers, square feet to square meters, U.S. gallons to liters, Imperial (British) gallons to liters, ounces to grams, pounds to kilograms, fahrenheit to celsius and vice versa.

After CLOADing and RUNing, you will find the menu which lists all the conversions. You will be asked which operation you would like and then asked how many inches, feet, ounces, etc.

This program is a good tool for teaching the young and old alike. So, the next time you are asked to run in a 6K race with some friends, you can tell them, "I can do 3.7284 miles easy!"

165.... 037E 290....0621 425....0932 END...0BEC

The listing:

Tille	113611	.9.					Land M. S.
10	,	**	****	+++	****	***	
15	3	*		netr	ric	*	
20	7	*	cor	ver	sion	*	
25	,	*	BY 3	IEFF	PYNE	*	
30	,	*	PORT	M	OUTON,	*	
35	,	*	N.S.	C	ANADA.	*	
40	,	**	****	**	****	***	
45	CL	S:	SOUNI	29	00,1:P	RINTe	13, "men
u"	119						
50	PR	IN	T"	A)	END		
55	PR	IN	T"	B)	METRI	C INP	UT"
60	PR	IN	T"	C)	INCHE	S-MIL	LIMETER

2						
65 PF	INT"	D)	INCHE	S-CEN	TIMET	ER
S"						
7Ø PR			FEET-	METER	35	
75 PF					METER	_
8Ø PF		G)	FEET (2) -ME	ETERS (2)
85 PF	INT"	H)	U.S.	GALLO	DNS-LI	TE
RS"						
90 PF		I)	IMPER	IAL E	BALLON	s-
LITER	ks"					
95 PF		J)	OUNCE	S-GRA	AMS"	
	RINT"	K)	POUN	IDS-K	LOGRA	MS
11						
1Ø5 F	RINT"	L)	FAH	ENHE	T-CEL	SI
US"						
11Ø F	RINT:PR	INT	TAB (E	3) "WHA	AT OPE	RA
TION?) ii					
115 A	NS=INKE	Y\$:	IF AN	1\$=""	THEN	11
5						
12Ø A	N=ASC (A	N\$)	-64			
125 I	F ANS	HR\$	(65)	OR AN	V\$>CHR	\$ (
	HEN 115					
13Ø C	IN AN GO	ITO	135,2	295, 14	10, 155	, 1
70,18	35,200,2	15,	230,2	245, 26	50,275	
135 0	LS: END					
140 0	LS: INPL	IT"H	OW MA	II YM	NCHES"	; I
145 F	RINT"TH	IAT	IS";]	*25.4	; "MIL	IM
ETERS	3"					
15Ø 6	SOSUB 54	Ø:G	OTO 1	40		
155 0	CLS: INPL	IT"H	OW MA	II YM	NCHES"	; I
160 F	RINT"TH	IAT	IS"; 1	*2.54	4; "CEN	TI
METER	₹5"		The state of the s		MI LO	
165 6	SOSUB 54	Ø: G	OTO 1	.55		
170 0	LS: INPL	JT"H	OW MA	ANY FI	EET";F	
175 F	RINT"TH	TAI	IS";F	*. 30	48; "ME	TE

```
RS"
180 GOSUB 540:GOTO 170
185 CLS: INPUT"HOW MANY MILES"; M
190 PRINT"THAT IS"; M*1.6093; "KIL
OMETERS"
195 GOSUB 540:GOTO 185
200 CLS: INPUT"HOW MANY FEET(2)";
FF
205 PRINT"THAT IS":FF*.0929; "MET
ERS(2)"
210 GOSUB 540:GOTO 200
215 CLS: INPUT"HOW MANY U.S. GALL
220 PRINT"THAT IS";G*3.7854;"LIT
ERS"
225 GOSUB 540:GOTO 215
230 CLS: INPUT"HOW MANY IMPERIAL
GALLONS" & G
235 PRINT"THAT IS"; G*4.546; "LITE
RS"
24Ø GOSUB 54Ø:GOTO 23Ø
245 CLS: INPUT"HOW MANY DUNCES"; 0
250 PRINT"THAT IS"; 0*28.35; "GRAM
5"
255 GOSUB 540:GOTO 245
260 CLS: INPUT"HOW MANY POUNDS"; P
265 PRINT"THAT IS"; P*. 4536; "KILO
GRAMS"
27Ø GOSUB 54Ø:GOTO 26Ø
275 CLS:PRINT"HOW MANY DEGREES"
28Ø INPUT"FAHRENHEIT"; F
285 PRINT"THAT IS"; (F-32) *5/9:PR
INT"DEGREES CELSIUS"
29Ø GOSUB 54Ø:GOTO 275
295 CLS:SOUND 200,1:PRINT@13,"me
nu"
300 PRINT"
             A) END"
3Ø5 PRINT"
             B) IMPERIAL INPUT"
310 PRINT"
             C) MILLIMETERS-INCH
ES"
315 PRINT"
             D) CENTIMETERS-INCH
ES"
320 PRINT"
             E) METERS-FEET
325 PRINT"
             F) KILOMETERS-MILES
33Ø PRINT"
             G) METERS(2)-FEET(2
) "
335 PRINT"
             H) LITERS-U.S. GALL
ONS"
34Ø PRINT"
             I) LITERS-IMPERIAL
GALLONS"
345 PRINT"
             J) GRAMS-OUNCES"
350 PRINT"
             K) KILOGRAMS-POUNDS
355 PRINT"
             L) CELSIUS-FAHRENHE
IT"
360 PRINT:PRINTTAB(8)"WHAT OPERA
TION?"
365 AN$=INKEY$:IF AN$="" THEN 36
```

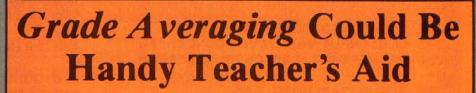
5

```
37Ø AN=ASC(AN$)-64
375 IF AN$<CHR$(65) OR AN$>CHR$(
76) THEN 365
38Ø DN AN GOTO 135,45,385,400,41
5,430,445,460,475,490,505,520
385 CLS: INPUT"HOW MANY MILLIMETE
RS"; M
390 PRINT"THAT IS"; M*. 0394; "INCH
ES"
395 GOSUB 540:GOTO 385
400 CLS: INPUT "HOW MANY CENTIMETE
RS";C
405 PRINT"THAT IS"; C*. 3937; "INCH
ES"
41Ø GOSUB 54Ø:GOTO 4ØØ
415 CLS: INPUT "HOW MANY METERS"; M
420 PRINT"THAT IS"; M*3.2808; "FEE
T"
425 GOSUB 540:GOTO 415
430 CLS: INPUT"HOW MANY KILOMETER
S":K
435 PRINT"THAT IS"; K*. 6214; "MILE
S"
44Ø GOSUB 54Ø:GOTO 43Ø
445 CLS: INPUT"HOW MANY METERS (2)
"; MM
450 PRINT"THAT IS"; MM*10.764; "FE
ET(2)"
455 GOSUB 540:GOTO 445
460 CLS: INPUT "HOW MANY LITERS"; L
465 PRINT"THAT IS"; L*. 2642; "U.S.
GALLONS"
47Ø GOSUB 54Ø:GOTO 46Ø
475 CLS: INPUT"HOW MANY LITERS":L
480 PRINT"THAT IS"; L*. 22; "IMPERI
AL GALLONS"
485 GOSUB 540:GOTO 475
490 CLS: INPUT"HOW MANY GRAMS"; G
495 PRINT"THAT IS"; G*. Ø353; "OUNC
ES"
500 GOSUB 540:GOTO 490
505 CLS: INPUT "HOW MANY KILOGRAMS
";K
510 PRINT"THAT IS"; K*2.2046; "POU
NDS"
515 GOSUB 540:GOTO 505
520 CLS:PRINT"HOW MANY DEGREES"
525 INPUT"CELSIUS";C
530 PRINT"THAT IS": (C*9/5)+32:PR
INT"DEGREES FAHRENHEIT"
535 GOSUB 540:GOTO 520
540 PRINT:PRINT"ANOTHER (Y OR N)
ЭH
545 RP$=INKEY$:IF RP$="" THEN 54
550 IF RP$(CHR$(65) THEN 545
555 IF RP$="Y" THEN RETURN ELSE
```

45







By Paul N. Luetke

rade Averaging is an attempt at what I consider useful programming. It isn't that game programs are useless, but I feel that CoCo should also be used to save time so that there's some left in which to play all those great games available for the powerful Color Computer. I began writing this program in November of 1981, about one month after purchasing my Color Computer. I must give due credit to Al Pomerantz, a good friend of mine, who not only convinced me of CoCo's power, but also gave me valuable help with this program.

In order to use this program as is, you must either use my system of grades/record keeping or adapt yours to suit. I keep cumulative records throughout the year using numbers which are later converted to letter grades. The following example should help to illustrate.

A+=0, A=1, A-=2, B+=3, B=4, B-=5, C+=6, C=7, C=8, D+=9, D=10, D=11, F=12, and incomplete work counts as a ZERO, or a 40 in this scale.

NAME Mon. Tues. Wed. Thurs. Fri. TOTAL Frank 1 8 10 16 19 19 grades--- A C A- C+ B+ B avg. 1 (1+7) 8 (8+2) 10 (10+6) 16 (16+3) 19

The first few lines of the program use a neat little routine I learned in order to clear the graphics pages without doing it directly from the keyboard. The program is initializing the numerous strings while the credit page is on screen.

The first menu to appear on screen asks the user to identify himself. The program is presently set up for four teachers and thirty students, but could easily be adapted for more by adding the needed names in line 280 and in the data statements beginning at line 1150. When entering this data be sure that the first name is that of the teacher and that at least 30 bits of data are recorded including empty quotes or you will get an OD error. The dimension statement in line 1090 must also be changed appropriately. C\$ is for teachers' and students' names. A is the variable for

(Paul Luetke, who is working toward a master's degree in computer assisted education, teaches on the junior high school level at Grace Lutheran School (WELS) in Durand, Michigan.)





daily grades and B is for test grades. PA refers to percentile average, GC refers to grade code, and FA is for the final average. The FOR/NEXT loops in lines 1100 and 1110 must also be changed if more teachers or students are to be used. Since I only have data for one teacher in the program, the X loop is 1 TO 1.

The second menu allows you to choose the subject to average. To change these subjects, edit lines 320 and 330 and 2320—2410. Note that the variable GC indicates the number of periods per week that the class is in session. An example of this would be language which is taught four days per week. This item is used in determining the student's overall average.

After entering the subject to average, the program will ask for the number of daily grades that you are averaging for that subject. Next, it asks for the number of test grades to be averaged.

Lastly, the program will ask for the grade weighting desired for each. The total of the two numbers entered here should be equal to 10. I use different weightings for each subject, but if daily grades count for 60 percent of the final grade and test grades count 40 percent, then you would enter a 6 and a 4 respectively. If no tests were given, then enter a 10 for the weighting of the daily grades and a 0 for the test grades.

The actual grade calculations take place in lines 770—790. The printing routine which prints both a class report and individual reports begins in line 1420. The program is written for the Line Printer VII.

Enter PMODE 0 before loading the program.

I hope that this program will be of use to many of you, especially those of you who are teachers. I have been printing weekly report cards for all of my students for the past two years. It takes me only about 20 minutes to enter all of the grades for all 10 subject fields. I have found that both students and parents appreciate it very much. It helps me also, because there are no surprises at quarterly marking periods anymore.

I realize that the program is quite long, so if you don't feel like typing it in, send me \$5 to cover shipping and handling and I will send you a copy. Write to: Paul N. Luctke, 8499 E. M-71 Lot 143, Durand, Mich., 48429.

The listing:

```
300...01AE 1460..0FED
420...049F 1670..128B
620...071F 1830..1472
840...097F 2010..177A
1110..0B9A 2180..19AA
1320..0E19 END..1DE0
```

```
100 PMODE0
110 GOTO130
120 GOTO140
130 GOTO2300
140 REM
150 PCLEAR1
160 CLS
170 PRINT@135, "GRADE AVERAGING"
180 PRINT@206, "BY": PRINT@232, "PA
UL N. LUETKE"
190 PRINT@329, "---- ----"
200 GOTO220
```

```
210 Z$=1NKEY$: IFZ$<>"THENRETURN
ELSE21Ø
22Ø CLEAR5ØØ
23Ø GOSUB1Ø9Ø
240 FORX=1T030:FORSC=1T010:FA(SC
,X)=1ØØ:NEXTSC.X
25Ø CLS
260 PRINT:PRINT" NAME
                              COD
27Ø PRINTSTRING$(32, "=");:PRINT
28Ø PRINT"LUETKE
                         1":PRINT
"HATZUNG
               2":PRINT"MUNDT
      3":PRINT"LUEDTKE
PRINT: INPUT"teacher code"; TC
29Ø CLS
300 PRINT"SUBJECT
                        CODE"
310 PRINTSTRING$(32,"=")
320 PRINT"LANGUAGE
                         1":GC(1)
=4:PRINT"SOCIAL STUDY
                        2":GC(2)=
5: PRINT"LITERATURE
                       3":GC(3)=5
:PRINT"MATH
                      4":GC(4)=5:
PRINT"SCIENCE
                     5":GC(5)=5:P
RINT"SPELLING
                    6":GC(6)=4:PR
INT"PENMANSHIP
                   7":GC(7)=1:PRI
NT"ART
                  8":GC(8)=1
330 PRINT"HYMNOLOGY
                         9":GC(9)
=1:PRINT"WORD OF GOD
                       10":GC(10)
=4:PRINT:INPUT"subject code";SC
340 ONSC GOSUB2320,2330,2340,235
0,2360,2370,2380,2390,2400,2410
35Ø CLS:PRINTSTRING$(32,"?");:PR
INT"??????????? HOW MANY ???????
????";:PRINTSTRING$(32, "?"):PRIN
T"DAILY GRADES FOR: "; N$;: INPUTN
360 PRINT@192, "TEST GRADES FOR:
";N$;:INPUTM
37Ø PRINT@256,STRING$(32,"?");:P
RINT"??????? GRADE WEIGHTING ???
?????";:PRINTSTRING$(32,"?")
380 PRINT@384, "DAILY GRADES FOR:
";N$;:INPUTE
390 PRINT@448,"TEST
                      GRADES FOR:
"; N$; : INPUTR
400 IFE+R<>10THENCLS:PRINT@128."
THE TOTAL WEIGHT MUST EQUAL 10":
FORX=1T01000:NEXTX:GOT0370
410 GV=GV+GC(SC)
42Ø ST=Ø
430 IFC$(TC,ST+1)=""THEN460
44Ø ST=ST+1:GOTO43Ø
450 PRINTSTRING$(32, "=");:PRINT
460 CLS:PRINT:PRINT" ENTER CUMUL
ATIVE DAILY GRADES":PRINT:SP$="
       ":QP$="
470 PRINTSTRING$(32,"=")
480 FORX=1TOST:W$=C$(TC,X):W$=W$
+SP$:W$=LEFT$(W$,10):IFX<10THENP
RINT" "; X; W$+"
                ";: INPUTA(SC, X):
NEXTX
49Ø PRINTX;W$+"
                  ";: INPUTA(SC, X)
```

: NEXTX 500 CLS:FORX=1TOST:W\$=C\$(TC,X):W \$=W\$+QP\$:W\$=LEFT\$(W\$,7):IFX<10TH ENPRINT" "; X; W\$; A(SC, X), : NEXTX 51Ø PRINTX;W\$;A(SC,X),:NEXTX 520 PRINT@418, "DO YOU WISH TO CH ANGE ANY?":GOSUB21Ø 53Ø IFZ\$="Y"THEN56Ø 540 IFZ\$="N"THEN600 55Ø IFZ\$<>"Y"ORZ\$<>"N"THEN52Ø 560 INPUT" ENTER THE STUDENT'S N UMBER" : X 57Ø IFX<10RX>ST THEN56Ø 580 INPUT"ENTER CORRECTED GRADE VALUE"; A (SC. X) 59Ø GOTO5ØØ 600 IFM=0THEN1390 610 CLS:PRINT:PRINT" ENTER CUMUL ATIVE TEST GRADES":PRINT 62Ø PRINTSTRING\$(32,"=") 63Ø FORX=1TOST:W\$=C\$(TC,X):W\$=W\$ +SP\$:W\$=LEFT\$(W\$,10):IFX<10THENP RINT" "; X; W\$+" ";:INPUTB(SC,X): NEXTX 64Ø PRINTX;W\$+" ";:INPUTB(SC.X) :NEXTX 650 CLS:FORX=1TOST:W\$=C\$(TC.X):W



\$=W\$+QP\$:W\$=LEFT\$(W\$,7):IFX<1ØTH

ENPRINT" "; X; W\$; B(SC, X), : NEXTX

660 PRINTX; W\$; B(SC, X), : NEXTX

It's like four games in one! Four entirely different screens provide hours of interesting entertainment! Battle spiders! Blast your way through the descending blocks! Defeat the enemy tanks! Trap the menacing cycles! Increasing levels of difficulty make each a real challenge! KRON is a fast ML program with multi-colors, Hi-Res, and many great sounds. It displays the top five scores plus has a pause feature and display mode.

TAPE \$26.95

32K STANDARD-JOYSTICK

DISK \$29.95

CATACOMB

Avoid enemy patrols while getting fuel for your escape from the catacombs! Then dodge or blast space mines and enemy ships as you travel the hyperspace corridor seeking the safety of your mothership waiting at the stargate! Catacomb is an original Hi-Res, multi-color, multi-screen, machine language program.

16K STANDARD-JOYSTICK



TAPE \$19.95 DISK \$23.95

PEEK COPY

The copier with a difference

- · Copies tape based software (even most autostarts)
- Displays memory in Hex and ASC11
- Allows insertion or change of machine code
- Displays start, end, and execute addresses of ML programs
 Is written in releastable machine learnings.
- Is written in relocatable machine language code

16K STANDARD

TAPE \$11.95

1130 NEXTY.X

1140 RETURN

PLEASE ADD \$2.00 EACH ORDER, POSTAGE/HANDLING OREGON COLOR COMPUTER P.O. BOX 11468, EUGENE, OR 97440 67Ø PRINT@418, "DO YOU WISH TO CH ANGE ANY?": GOSUB21Ø 680 IFZ\$="Y"THEN710 690 IFZ\$="N"THEN750 700 IFZ\$<>"Y"ORZ\$<>"N"THEN670 710 INPUT" ENTER THE STUDENT'S N UMBER"; X 720 IFX<00RX>ST THEN710 730 INPUT"ENTER CORRECTED GRADE VALUE"; B(SC, X) 74Ø GOTO65Ø 750 CLS 760 FORX=1TOST 77Ø F=(((A(SC,X)/N)*E)+((B(SC,X)/M) *R)) / 1Ø $78\emptyset PA(X)=PA(X)+F*GC(SC)$ 79Ø F=INT(F+.5) 800 IFXY=8THEN1340 810 FA(SC, X)=F 820 IFF=100THENGOSUB1080:GOTO850 830 IFF>12THENF\$="F ":GOTO850 84Ø GOSUB242Ø 850 W\$=C\$(TC,X):W\$=W\$+SP\$:W\$=LEF T\$(W\$,1Ø) 86Ø PRINT" "+W\$:F\$. 87Ø NEXTX 88Ø IFQW=8THEN126Ø 890 PRINT@420, "DO YOU WANT TO AV ERAGE": PRINT@458, "MORE GRADES" *900* GOSUB210 910 IFZ#="Y"THEN290 920 IFZ\$="N"THENPRINT" are you sure??";:INPUTAS\$ 930 AS\$=LEFT\$(AS\$,1):IFAS\$="Y"TH EN12ØØELSE29Ø 94Ø IFZ\$<>"Y"ORZ\$<>"N"THEN89Ø 950 F\$="A+":RETURN 960 F\$="A ":RETURN 970 F="A-":RETURN 980 F="B+":RETURN 990 F#="B ":RETURN 1000 F=="B-":RETURN 1010 F#="C+":RETURN 1020 F\$="C ":RETURN 1030 F\$="C-":RETURN 1040 F\$="D+": RETURN 1050 F#="D ":RETURN 1060 F\$="D-":RETURN 1070 F#="F ":RETURN 1080 Fs=" ": RETURN 1090 DIMC\$(4,30),A(10,30),B(10,3 Ø),PA(3Ø),GC(1Ø),FA(11,3Ø) 1100 FORX=1TO1 1110 FORY=0T030 1120 READC\$(X,Y)

1150 DATA "LUETKE", "MICHAEL", "JI

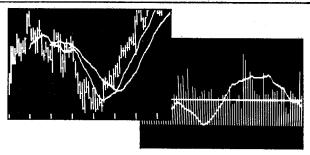
M", "SUSAN", "CHRIS", "DAVID", "BECK

Y", "SHANNON", "BETTY", "TINA", "WES

","KATHY","HARMON","MELYNDA","JE RRY", "REBECCA", "ERICA", "BEN", "ME LANIE", "MATTHEW", "MARTHA", "DEBOR AH", "KAREN", "BURT", "", "", "", "", " 116Ø DATA 117Ø DATA 118Ø DATA 119Ø DATA 1200 CLS 121Ø PRINT" DO YOU WANT TO SE E THE 122Ø PRINT" OVERALL AVERAG ES ":GOSUB21Ø 123Ø IFZ\$="Y"THEN13ØØ 124Ø IFZ\$="N"THEN126Ø 125Ø IFZ\$<>"Y"ORZ\$<>"N"THEN121Ø 1260 PRINT:PRINT" DO YOU WANT TO SEE THE":PRINT" DECIMA L AVERAGES": GOSUB21Ø 127Ø IFZ\$="Y"THEN133Ø 128Ø IFZ\$="N"THEN142Ø 129Ø IFZ\$<>"Y"ORZ\$<>"N"THEN126Ø 1300 QW=8:CLS:PRINT" ALL AVERAGES":FORX=1TOST 1310 F=PA(X)/GV:FA(11,X)=F:SC=0 132Ø GOTO79Ø 133Ø CLS:PRINT" DECIMAL A VERAGES": FORX=1TOST

1340 W\$=C\$(TC.X):W\$=W\$+QP\$:W\$=LE FT\$(W\$,9) 1350 PRINT" "+W\$;:PRINTUSING"##. ##";PA(X)/GV;:PRINT"", 136Ø NEXTX 1370 PRINT:PRINT:PRINT"PRESS ANY KEY TO CONTINUE" 1380 A\$=INKEY\$:IFA\$<>""THEN1420E LSE138Ø 1390 FORX=1TOST:B(SC,X)=1:NEXTX 1400 M=10000000000 141Ø GOTO75Ø 1420 CLS:PRINT"ENTER ENDING DATE OF THE PRESENTGRADING PERIOD [MON-DAY-YEAR] "::INPUTVB\$ 1430 CLS:PRINT"IS THE PRINTER RE ADY?":GOSUB21Ø 144Ø IFZ\$<>"Y"THEN143Ø 1450 CLS:PRINT" **WOULD YOU** LIKE A":PRINT" CLASS REPO RT CARD" 146Ø GOSUB21Ø 1470 IFZ\$="Y"THEN1480ELSE1670 148Ø PRINT#-2,CHR\$(31);TAB(5)"CL ASS REPORT ENDING ["; VB\$; "]":P RINT#-2, CHR\$ (3Ø) 149Ø PRINT#-2,"" 1500 GOSUB2150:FORX=1TOST

MTS MARKET CHARTER MTS LOG MTS DATA NETWORK



PROFESSIONAL LEVEL INVESTMENT TOOLS NOW AVAILABLE FOR THE COLOR COMPUTER. POWERFUL TECHNICAL ANALYSIS FUNCTIONS INCLUDING MULTIPLE VARIABLE MOVING AVERAGES, RATE OF CHANGE, OSCILLATORS, ETC. PLUS AUTOMATIC DAILY UPDATING OF PRICE AND VOLUME FILES VIA MODEM UTILIZING LOCAL AREA PHONE NUMBERS.

SYSTEM COLOR COMPUTER 32K*
REQUIREMENTS: 1 DISK DRIVE

PRINTER (Optional) HAYES SMARTMODEM

(Required For Auto Price Updating)

PRICE: MTS MARKET CHARTER—\$95.00

MTS LOG & DATA NETWORK—\$25.00 Per Month PRODUCT MANUAL—\$25.00 If Purchased Separately

Send Order Or Inquiry To:



MTS

Market Timing Software, Inc. 6912 N. Sheridan Rd. Chicago, IL 60626

*ALSO AVAILABLE FOR TRS 80 MOD III, II, 12 AND 16; IBM-PC, APPLE II PLUS, ETC.

1510 W\$=C\$(TC,X):W\$=W\$+SP\$:W\$=LE FT\$(W\$, 10) 1520 PRINT#-2.Ws;" 153Ø FORSC=1T01Ø 1540 IFFA(SC, X)=100THENGOSUB1080 :GOTO1560:ELSEIFFA(SC, X)+1>12THE NF\$="F ":GOTO1560 1550 ONFA(SC.X)+1GOSUB950.960.97 0,980,990,1000,1010,1020,1030,10 40,1050,1060,1070 1560 PRINT#-2,F\$+" 157Ø NEXTSC 1580 F=PA(X)/GV:F=INT(F+.5) 159Ø IFF=1ØØTHENGOSUB1Ø8Ø:GOTO16 10:ELSEIFF>12THENF\$="F ":GOTO161 1600 GOSUB2420 1610 PRINT#-2," 1620 PRINT#-2, USING"##.###";FA(1 1,X) 163Ø NEXTX 164Ø PRINT#-2,"":PRINT#-2,"":PRI NT#-2,"" 1650 CLS:PRINT"WOULD YOU LIKE AN OTHER?": GOSUB21Ø 1660 IFZ\$="Y"THEN1480ELSE1670 1670 CLS:PRINT"WOULD YOU LIKE IN DIVIDUAL REPORT CARDS FOR ALL Y OUR STUDENTS": GOSUB21Ø 168Ø IFZ\$="Y"THEN17ØØ

FILE CABINET A SERIOUS UTILITY MULTIPURPOSE INFORMATION MANAGEMENT

Maintain any file you create; inventory, investments, mailing lists, budgets, recipies, etc.

Alphabetizes

Sorts Numeric Entries

Searches for key words or numbers

Computes totals & averages by catagories

Saves Pagerds, changes or deletes them.

Saves Records, changes or deletes them, up to 20 entries for each record, up to

256 characters for each entry.

preformated mailing list & recipie program included

Output to Screen, Printer or Tape. PRINT all or selected records.

+, -, X, ÷ Numeric Entries.

Owners Manual included with sample files 16K, 32K, Memory Expandable. Extended Basic Required



Moreton Bay

\$29.95 postage paid CA Residents Add 6% Sales Tax

MORETON BAY SOFTWARE

A DIVISION OF MORETON BAY LABORATORY 316 Castillo Street Santa Barbara, CA 93101 (805) 962-3127



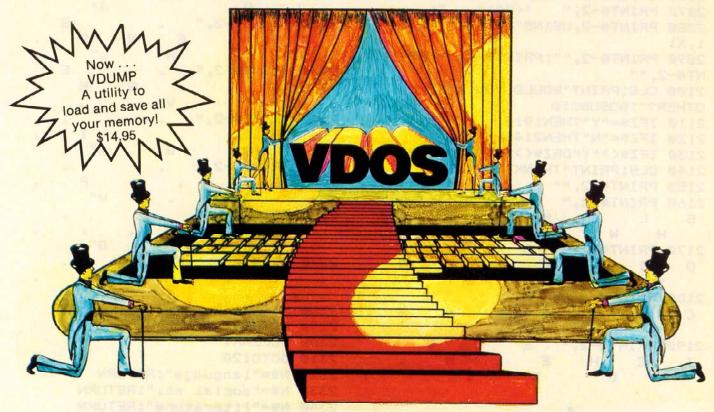
REPORT FOR "; CHR\$(31); W\$; C HR\$(3Ø); "ENDING ["; VB\$; "]": PRI NT#-2,"" 1720 GOSUB2150 1730 W\$=C\$(TC,X):W\$=W\$+SP\$:W\$=LE FT\$(W\$, 1Ø) 1740 PRINT#-2, W\$;" 1750 FORSC=1TO10 1760 IFFA(SC,X)=100THENGOSUB1080 :GOT0179Ø 1770 IFFA(SC, X)+1>12THENF\$="F ": GOT0179Ø 1780 ONFA(SC,X)+1GOSUB950,960,97 0,980,990,1000,1010,1020,1030,10 40, 1050, 1060, 1070, 1080 179Ø PRINT#-2,F\$+" 1800 NEXTSC 1810 F=PA(X)/GV:F=INT(F+.5) 1820 IFF>12THENF\$="F ":GOTO1840 1830 GOSUB2420 1840 PRINT#-2," 1850 PRINT#-2, USING"##, ###"; FA(1 1860 PRINT#-2,"":PRINT#-2." A-=2 B+=3 B=4 B-=5 A=1 D+=9 C+=6 C=7 C-=8 D=1Ø D-=F=12":PRINT#-2, "":PRINT#-2, " ":PRINT#-2,"" 187Ø NEXTX 1880 CLS:PRINT" WOULD YOU LIKE A REPORT CARD FOR A SPECIF IC STUDENT": GOSUB210 189Ø IFZ = "Y"THEN 191Ø 1900 IFZ\$="N"THEN2140 1910 CLS:FORX=1TOST:Ws=Cs(TC,X): W\$=W\$+SP\$: W\$=LEFT\$(W\$, 10): IFX<ST THENPRINT" "; X; W\$, : NEXTX 1920 PRINT: INPUT"PLEASE ENTER TH E STUDENT NUMBER";X 1930 INPUT"PLEASE ENTER THE STUD ENT'S NAME"; XA\$ 1940 PRINT#-2, CHR\$ (30); TAB (15)" REPORT FOR "; CHR\$(31); XA\$:" ";CHR\$(3Ø);"ENDING ["; VB\$; "]": PRINT#-2,"" 1950 PRINT#-2."" 1960 GOSUB2150 1970 W\$=C\$(TC,X):W\$=W\$+SP\$:W\$=LE FT\$(W\$, 10) 1980 PRINT#-2,W\$;" 1990 FORSC=1TD10 2000 IFFA(SC,X)=100THENGOSUB1080 :GOTO2020:ELSEIFFA(SC, X)+1>12THE NF\$="F ":GOT02020 2010 ONFA(SC,X)+1GOSUB950,960,97 0,980,990,1000,1010,1020,1030,10 40,1050,1060,1070,1080

1700 FORX=1TOST:W\$=C\$(TC,X):W\$=W

1710 PRINT#-2, CHR\$(30); TAB(15)"

\$+SP\$:W\$=LEFT\$(W\$,10)

THE UN-DISK



UN-BELIEVABLE

But true! There is a disk drive in your Color Computer... and it is faster and more efficient than any "hardware" drive you can buy, for any price. This new "disk drive" is called VDOS—for Virtual Disk Operating System—and it will absolutely revolutionize the way you operate your CoCo.

VDOS lets you use the "extra" memory inside your CoCo as a virtual disk, with programs (any programs) stored out of the way. You can "save" and "load" programs from your in-memory

disk into working memory, and then run them. When you're done, you can simply access your in-memory disk again . . . and save or load another, and another.

And VDOS is fast.
Because you are using memory rather than a mechanical device (like a disk drive or cassette player), programs load instantly. Yes, VDOS is faster than a disk!

VDOS works with all Color Computers—from 16K non-extended to 64K extended. Obviously, the more memory you have, the greater number (and length) of programs you can store. For a 64K system, VDOS also uses the "unused" part of memory, providing up to 50,000 bytes of storage! Now, that's some disk!

We call it VDOS because in the future there will be utilities for your VDOS UNDISK that will give even greater capabilities—such as a full one-pass memory dump to cassette. Other utilities are planned, too.

We believe VDOS is the

greatest advancement for CoCo since the introduction of the disk drive itself. And, at less than \$100, it is so inexpensive you can't afford to be without it. If you have the "cassette blues," VDOS is the answer!

Finally, VDOS is simple to operate. It is entirely self-prompting and comes with a complete manual. But you almost don't even need the instructions—it requires absolutely no technical expertise.

VDOS. The answer to your prayers.

Cassette: \$49.95 Add \$1.50 shipping and handling; Canadians add \$5 for shipping; Foreign points add \$9. VISA and Master Card accepted. All Kentucky residents add 5% sales tax. Payments accepted in United States currency only.



Dr. Preble's Programs 6540 Outer Loop Louisville, KY 40228 (502) 241-6474 Dealer Inquiries Invited



2020	DDTA	\T#-2,F	44"	11 g			
2030			.	,			
		; 3C } (X) /GV	1 - E - Thi	T / E.	. =\		
						1/47	/2
		12THEN	()- A= L	= (50102	210 /	10
		JB242Ø					
		\T#-2,"				'	
2Ø8Ø	PRIN	\T#-2,L	SING"	##. :	###";	FA	(1
1,X)							
2090	PRIM	\T#−2,"	":PRI	NT#	-2,"'	':F	RI
NT#-	2,""						
2100	CLS	PRINT"	WOULD	YO	U LIK	Œ	AN
		30SUB21					
2110	IFZ:	\$="Y"TH	EN191	Ø			
212Ø	IFZ:	5="N"TH	IEN214	Ø			
		\$<>"Y"C			THEN2	211	Ø
		PRINT"					
		\T#−2,"	1 11				
		\T#-2, "	' N			1	
S	L	''' _ ,	s	9	P	_	Δ
_	4	W	G	-	יים.		•••
•	•	 \T#−2."	' A		-	Α	
0	I	Α, π Σ,	С	P	E	,,	R
_	, •	0	Ř	•	Ε"		- 11
	•		' 'M		L	N	
		•	• •	_	k.i	14	-
C.	T	_ T	I	Ε	C !!		ş
•	۹ 	R	. A_		L"	_	
		√T#-2,'	' _ E		6.4	G	
I	E	_ H	Ε_	L	M		•
t	V	D	D		I"		

Aunona Software

49 BROOKLAND AVE. AURORA, ONTARIO CANADA L4G 2H6

FAMILY GAMES

FOR 16K AND 32K COLOR COMPUTER

STOCKBROKER — Up to 6 players can play the stock market. For 16K or 32K ECB. The 32K is in High-Res Graphics.

CRIBBAGE — For 2 or 4 players. In High-Res Graphics! (for 32K).

BATTLE — Will you get bombed before you can find all the ships? An extremely entertaining game for the family.

COLORMIND — Up to 4 players challenge for hiddencolors.

REMREM — Challenge your friends. Who can remember the longest color sequence?

CONCEN — Challenge the computer or a friend to a good ol' game of concentration.

ALL GAMES only \$20.00 or ANY TWO for \$35.00

ALSO FROM Aurora Software:

MR. COPY — A quality copier written in M.L. that will make backup tape copies. MR. COPY is capable of making up to 99 copies in one loading! \$25.00

ROMDISK — If you have a modified 32K C.C. machine ROMDISK will allow you to load your R.S. Rom Packs from a disk! \$20.00

2200	PRI	NT#-2,	, 11				U	
Α	R			N	L	Α		
ε	כ			E	_	M"		-
2210	PRI	NT#-2.					Α	
L	A		•	c ·	I	N	••	_
	••	ο.		_	•	Δ"		•
2220	- PDTI	NT#-2.	11			-	G	
~~~~	T T	·• · π - Δ ;	1	Ε.	N	s	G	
,	, '	F.			14			•
_	_	r NT#−2,	11	A		L		
		NI#-2,	1	-	_		Ε	
S	ַט			•	8	Н		•
-	3 			٧				
224Ø		NT#-2,	· "	•			•	
Ŧ	R	•			•	I		•
,	1	G		G		Α"		
225Ø	PRI	NT#-2,	, "					
•	Ε					P		-
		0		•		V"		
226Ø	PRI	NT#-2,	, 11	•			-	
•		•		•				
		D		•		G"		
227Ø	PRI	NT#-2,	. "	•				
		•				•		
. 1						. 11		
228Ø	PRI	NT#-2.	. " '	ı				
2290								
2300	PCL	EAR1						
2310								
		"langı	ıac	16":S	FTI	RN		
		"soci						
		"liter						
		"math				101111		
		"scier				Ni		
		"spel						
2380		"penma				יטואט		
2390		"art":				1 15-5-1		
		"hymno						
		"word						_
		+1G0Sl						
7Ø, 1	7ØØ,	1010,	lØ:	2Ø, 10	IJØ,	1040,	, 1Ø	5Ø

Hint . . .

,1060,1070

243Ø RETURN

### Speed Up Your CoCo

You can double the speed at which CoCo operates with a simple POKE statement, entered either directly from the keyboard or within a program. The statement is POKE 65495,0. This will speed up your CPU. You can return the computer to normal speed again by POKE 65494,0.

Note that you cannot perform any Input/Output operations, such as saving the program to cassette, when the speedup is in effect. You may also lose temporary keyboard control. If this happens, a simple press of the RESET button will bring things back to normal, too.

### **DO YOU HAVE A BASIC OR ASSEMBLY PROGRAM TO SELL?**

### . . . avoid unreliable cassette tapes and recorders and EPROM your program!

With EPACK, BASIC and assembly routines for color computer can be read from cassette tape and stored onto 2516, 2716 (single supply), 2732, 2532, 2564 and 2764 styled EPROM (21 and 25 volt). These EPROM are then inserted into MMB, a game packlike cartridge that automatically executes your program when it's inserted into the color computer . . . just like the game packs.

EPACK is an excellent alternative to cassettes for programs you want to sell and for personal programs you would like to execute quickly and conveniently from a more reliable medium.

NOTE: 2732, 2764 and 21 volt capability are available optionally and are not included in the standard EPACK. **

<b>EPACK</b> consists of <b>EPG</b> , <b>BROM</b> and <b>MMB</b> for		\$150.00
	· · · · · · · · · · · · · · · · · · ·	

The units in EPACK are sold individually as follows:

### BROM

Utility fits any memory size color computer. Its function is to process BASIC source files into a format that can be written out to EPROM by Control Craft Inc.'s EPROM programmer (EPG) . . . and still be executed by the BASIC interpreter - but from EPROM, not RAM!

### EPROM PROGRAMMER (EPG)

- Zero insertion force socket
- Personality plugs configure programmer to accept 2716 (5 volt supply), 2532 and 2564 style EPROM.
- Programmer's software is included on the programmer board as firmware.
- Program sources:
  - read cassette tape files into memory and then write file to EPROM (files are in Radio Shack format)
  - * write color computer RAM to EPROM
  - * read EPROM inserted in programmer into RAM
  - * write color computer ROM to EPROM
- Functions:
- * test EPROM to see if it's unprogrammed
- read an EPROM into color computer RAM
- write RAM buffer out to EPROM
- * redefine the location of the RAM buffer
- verify the programming of an EPROM
- * compare the contents of RAM buffer against an EPROM
- edit the RAM buffer
- 1. Examine/change memory locations
- 2. Examine/change start buffer address
- 3. Fill RAM buffer with FF hex
- read blocks from a cassette file into RAM
- Menu driven operation allows easy use
- Plastic case enclosed circuitry
- Gold plated edge connectors
- · Self-contained unit . . . no external power supplies are used
- Unit operates on any memory sized TRS-80 color computer
- \$105.00

### MULTI MEMORY BOARD (MMB)

- Complete with support IC, sockets and decoupling capacitors
   Accepts 2516, 2716, 2532, 2732, 2564 EPROM (included in EPACK)
- Accepts 2016, 4016, 6116 static RAM
- Max capacity of 6 memory chips
- Runs on any size TRS-80 color computer
- Board is jumper addressable to either \$C000 or \$8000
- Provisions for write protect switch, or can jumper the board to write protect RAM

- Jumpers configure the memory type used on the board. Provisions for inserting DIP switches in place of the jumpers
- Gold plated edge connector
- Each IC or IC socket has decoupling cap installed
   Plastic case is available extra, at \$7.50 (pricing is subject to change) without notice) (case included in EPACK)
- * RAM may not work with series E or later color computers.

MMB ..... \$30.00

UPGRADE (optional for EPACK or EPG) 2732-21 volt . . . . . \$15.00 2732-25 volt . . . . . . \$15.00 2764-25 volt ..... \$15.00 2764-21 volt ..... \$15.00

OKIDATA owners know that in order to print graphics they lose their serial interface . . .

### **NOT ANY MORE!**

Now you can print Hi-res Pmode 4 graphics images, full size and detail, on your OKIDATA, EPSON and other printers, without dot addressable capacity.

#### Features:

- · Callable from BASIC routine
- Runs stand alone with a menu.
- Relocatable
- · Automatically finds the start of graphics pages
- Configurable for several printers
- Fast Useable on 16 or 32 or 64 K
- machines with or without Extended BASIC
- Documented

(OKIDATA, EPSON and RS are trademarks)

Actual graphics printed on an OKIDATA printer (shown reduced)

SDUMP

All prices subject to change without notice.

ONTROL		
<b>LONTROL</b>	LRAFT	INC.
CONTROL		MITT.
	•	

19270 North Hills Drive • Brookfield, WI 53005 • (414) 784-9027

Name _ Company ___ Address ___

_____Zip _____ City/State ___

Shipping address (if different from above)

Order Form: **FPACK** __ @ \$150.00 = ___ BROM ____@ \$ 25.00 = _____ EPG _____ @ \$105.00 = ____ MMB _____ @ \$ 30.00 = _____ SDUMP ___ @ \$ 25.00 = _____ UPGRADE NO.___ _____ @ \$ 15.00 = Wis. residents add 5% sales tax Shipping & Handling: # of items _____ x \$2.00/item = ___ TOTAL ORDER:

> TO ORDER BY MAIL: SEND MONEY ORDER, CERTIFIED CHECK, CASHIERS CHECK MASTERCARD/VISA (include card number, inter-bank number, expiration date and signature).

DEALER INQUIRIES WANTED (minimum dealer order is 10 units)



### By Dan Downard Rainbow Technical Editor

What do a kernel, tree, pipeline, path, shell and gobbler have in common?

Nothing but OS-9, the new Radio Shack operating system for the new 64K CoCo. Sounds like a verse of Old MacDonald, doesn't it? Actually the new CoCo and the operating system are to be sold in separate packages, but they go together to form one of the most dynamic innovations in the personal computer field to date.

Imagine yourself sitting in front of your CoCo running a program, or maybe playing a game, while a friend is accessing files to his program through your RS-232 port. How about running Pascal, C and several other high level languages? All of this on a \$199 computer? Well, to be realistic, we are talking in the neighborhood of \$800, when you include the disk drive and all. Yes, you can have the most sophisticated microcomputer system available today for less than half the cost of a bare-bones Apple II.

OS-9 is a multi-user, multi-tasking, operating system developed for Tandy by Motorola and Microware for the Color Computer. It is being marketed simultaneously with a new 64K Color Computer with a "real" keyboard and a few other minor changes. To sum the combination in a short phrase, I would say that Tandy is "far ahead of any competitor." No longer is the CoCo just for games and "a toy" (not that it ever was!)

### 64K CoCo-A New keyboard

By the time you are reading this review the new 64K Color Computers should be on the dealers' shelves. We have been hearing rumors of new CoCo for some time now and finally one has appeared. How much is new? Well, the keyboard for a start. As you can see the 64K CoCo and CoCo 2 have a typewriter-like keyboard with keys—that "travel." There is more to the keyboard than meets the eye. A full RF shield covers the bottom plane of the circuit board supporting the keys. It is grounded by means of a metal clip to the computer board. All keys are spill resistant and have a good "touch." I welcome this addition to the family. We understand that it will be available for \$39.95 (plus installation) for upgrading existing CoCos.

### Other Changes

The new computer is housed in a fawn-gray enclosure instead of battleship gray, but very similar to the existing CoCo. Obviously a 64K CoCo has to have 64K chips. I wonder how many of you realize that if you have a "285" board with 32K chips you already have 64K. More than that, if you have the 1.2 BASIC and the 1.1 Extended BASIC ROM you have the same thing inside your computer as the 64K CoCo. I guess you could say it was a surprise when we discovered that there had been no changes to the boards for this revision. On the other hand, there have been a few minor

changes to the ROMs. Following is a brief description of the changes.

Addresses Change

### Extended BASIC 1.1

80D0-80DD	Corrects bug with parse counter
80FF	Changes "1.0" to "1.1"
8112	Changes "1980" to "1982"
8C1B-8C51	Corrects bug in DLOAD
9179-917D	Changes to RS-232 out
962C-962D	Changes to PMODE
96A3-96B3	Corrects PCLEAR error
	DACIC 1 2

BASIC 1.2

A001	Changes entry address of POLC	CAT

A114	New Baud constant
A155	Changes "1.1" to "1.2"
A15E	Changes "1980" to "1982"
A1B6	Changes branch to POLCAT
A1C1-A26D	Revised POLCAT routine
A2C3-A2D5	Poll Pin 2 before printing
B3F3-B426	Changes to INTCNV
B9D6	Correct bug in subtract routine

The only change that should affect anyone is the different address of POLCAT, or the keyboard scan routine. The new entry point is \$A1CB instead of \$1A1C1. I would not advise you to rush out and buy new ROMs as the present versions are compatable. There are changes to the DISK ROM in the works too. Since we did not have the new controller the only thing we know for sure is that the new DISK ROM will have

hange

05-9

The real strength of the new package lies in the operating system. Tandy, along with Motorola and Microware, have adapted their *UNIX* based *OS-9* system to the Color Computer. In today's vernacular I would term it "awesome." *OS-9* is a multi-user, multi-tasking, interrupt driven DOS with multi-level file structures.

a DOS command for booting OS-9.

Boy, that's a mouthful. By multi-user, we mean literally that one person can operate CoCo from the keyboard while another can access the computer using the RS-232 port via a remote terminal (which can be another CoCo).

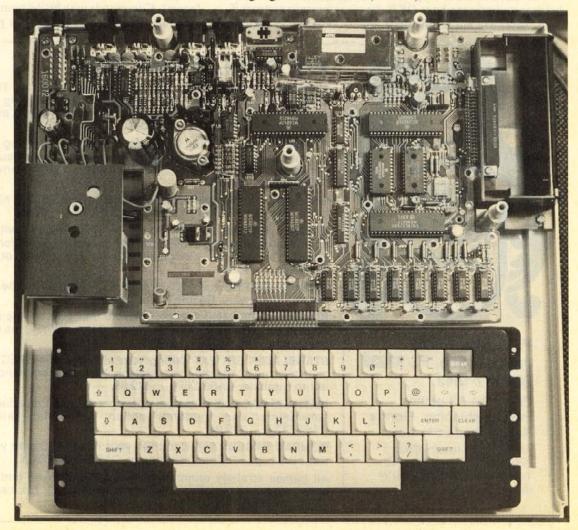
Using multi-tasking involves the processor performing two or more tasks simultaneously such as inputting to one file while outputting another to the printer. Interrupt driven implies a real-time processing environment that is user friendly. In fact, OS-9 has a real-time clock running continuously that will give you time with a keystroke.

We will discuss multi-level files, but in essence the easiest way to understand it is to visualize a disk with more than one directory. With OS-9 you can have as many directories as you want and any directory can contain another subdirectory, or files. Tracing this hierarchial structure is called a "path."

As you can see, this system is a little more complex that Disk BASIC, but don't let that scare you. As was mentioned earlier, this DOS opens a wealth of business, scientific and engineering software to the CoCo along with new high-level languages such as Cobol, Pascal, etc.

### Peek Inside The New 64K CoCo.

"I wonder how many of you realize that if you have a '285' board with 32K chips you already have 64K. More than that, if you have the 1.2 BASIC and the 1.1 Extended BASIC ROM you have the same thing inside your computer as the 64K CoCo. I guess you could say it was a surprise when we discovered that there had been no changes to the boards for this revision."



Some of the more interesting features of OS-9 are the utilities provided with the package. Not only do you get the operating system, but excellent text editor, assembler and debug programs. No high resolution screen is provided but upper-lowercase is fully functional for future upgrades. The printer driver supports varied formats and the entire system can be tailored for your needs.

On the other hand BASIC is not supplied with the operating system and will be available as a separate package as will other higher level programming languages. You can still use Disk BASIC on the same computer, but not with OS-9.

The documentation is extensive. Four different manuals are provided. True to the CoCo tradition the first manual is named "Getting Started With OS-9." An overview of system operation and startup procedures is given in a clear, concise format with several examples. Other documentation includes a User's Manual and a Technical Manual along with a manual for the Editor, Assembler and Debugger. The latter manuals are similar to the Model I and III formats with considerably greater detail with regard to the operating system. I was amazed at the volume of documentation. Tandy probably has to cut down a whole tree for each set.

### Booting OS-9

To run OS-9 you need a 64K CoCo with one disk drive. No new hardware is required for the new operating system. The system is supplied on two disks. The first disk is formatted in Disk BASIC and contains two programs, a drive speed check (a real bonus!) and the OS-9 boot program.

The speed check is very user friendly and recommended before attempting to boot *OS-9*. An error message appears if your drives are not in tolerance, that is, between 298.0 and

303.5 RPM. You are requested to return the drive(s) to a service center for adjustment if they fail the test. You can do this yourself. We'll have details next month.

Booting the new system isn't very complex. Two different methods are described, depending on the version of your DISK ROM. With Version 1.0, the boot disk is inserted and you type  $RUN^{"*}$ . You are prompted to insert the system master disk and that's it. With Versions 1.1 and later you just type DOS. You are then greeted with the startup message:

OS-9 LEVEL ONE
RS VERSION 01.00.00
COPYRIGHT 1980 BY MOTOROLA, INC.
AND MICROWARE SYSTEMS CORP.
REPRODUCED UNDER LICENSE
TO TANDY CORP.
ALL RIGHTS RESERVED
YY/MM/DD HH:MM:SS

You answer the prompts with the date and time and you're in business. The disks are not copy protected as you will have to make several backups of the system disk if you are using a single drive for your various files and directories. Step-by-step instructions are given on making a backup and are easy to follow. Disks are in a different format than Disk BASIC and have to be formatted with *OS-9* before the backup is made.

### The "Shell"

The shell, or command processor, is the heart of OS-9 that interfaces the user to the DOS. Commands may be entered in upper or lower case but must be entered in a structured format. Commands may be the name of a machine language program on disk or in memory, a program or a procedure



### P. O. Box 14806 Jacksonville, FL 32238 904 777-1543

Prices on All games include shipping. Florida Resident add 5% tax.

All Programs require Color ComPuter™ (Tandy Corp) or TDP System 100 ComPuter™ (RCA)

### WE CHALLENGE YOU!

ACROSS THE RUBICON 16K EXT or NON EXT — The popular WWII wargame. Break thru the Huertgen Forrest using infantry, tanks, paratroops, air and artillery strikes and destroy Hitler's plans for the Battle of the Bulge. CASSETTE...\$19.95.

**RUBICON II** 32K EXT The wargamer's choice! Everything ATR has and mortar units, patrols, German artillery, platoon movement, supply, intelligence, spotting rounds, unit merge, game save and much more! CASSETTE...\$24.95.

**GALACTIC TAIPAN** 32K EXT Battle storms, pirates and high taxes in hopes of making a profit in the galaxy. CASSETTE...\$19.95.

MISSION EMPIRE 32K EXT cass or disk. Starting with one planet, incomplete intelligence and limited resources, you must form alliances, build armies and conquer the galaxy. Game save. Cass or Disk version on Cassette...\$19.95.

MISSION EMPIRE 16K EXT or NON EXT. With all of the above except advanced play levels. CASSETTE. \$19.95.

**BOMBER COMMAND** 16K EXT The air war over Germany, 1941-45. Player must destroy German industry while fighting off flak, the Luftwaffe and bad navigation. CASSETTE...\$19.95.

**STARBLAZER** 32K EXT During your absence, the SPECTRUM galaxy has been overrun by the draconic xyclons. Now you command the only Starship left to retaliate. CASSETTE...\$19.95.

MATH SKI-RACE 16K For elementary grades K-6. Remediation. Teacher sets parameters and students polish arithmetic skills a fun way. CASSETTE...\$19.95.

ROMPAC BACKUP 64K Can't run your ROMPACS with your disk in or just want backups? R.B. makes it easy. CASSETTE ONLY...\$15.95.

All games strategy oriented, graphically portrayed and guaranteed from defect and boredom. For DISK version add \$3.00. No mail delays with personal checks. State system with order.

file. A typical command would appear as: dir / D0/BUSINESS

This particular command would list the contents of directory BUSINESS in Drive 0. Commands are separated by spaces. Normally directories are uppercase and files lowercase by convention. Modifiers for I/O are flagged by a /.

Five different I/O devices are contained in the System Service Directory called by the SHELL. P is the printer, D0 is drive 0, TERM is the keyboard/display, D1 is drive 1 and T1 is a terminal connected to the RS-232 port. All input and output can be directed through any of these devices.

To give you an example of the different levels of directories, D0, or drive 0, actually contains another directory called the Root Directory. This directory contains all of the commands in another directory called CMDS plus a file called startup. Startup is called each time the system is booted and normally contains user initialization for such things as printer Baud rate, terminal parameters, etc.

One of the disappointments was the lack of a high resolution screen. I don't think it will be long before one appears on the market, but Tandy already has them with other software and I can't understand why it wasn't implemented. At the same time, the screen is scroll protected every 16 lines. No more holding the shift-@ key to see what you want before it disappears. Several keys have been redefined and all control characters are available. The clear key is used as a "control" key for most operations.

### Other Features

Sequential and random access files are supported by OS-9. Every file has attributes such as read, write and execution

by the owner, or the public. Disk format, although different from Disk BASIC, maintains the same number of tracks and sectors on the disk with one important exception. OS-9 allocates disk space by "clusters." A cluster can be from one to any integral power of two (2, 4, 8, etc.). One sector of each disk is used as a bitmap indicating which clusters are in use.

A technique called "timeslicing" allows all active processes to share CPU time. A real-time clock interrupts the processor 60 times a second. The interruption points are called "ticks." At any tick, the DOS can suspend execution of one program and begin another. Each process is assigned a priority from 0 to 255 with 0 being the highest. The shell has the highest priority due to 1/O, etc. By this method, several programs can be executed at the same time.

What this means is that your CoCo now has a *true* time-sharing system—just like a mainframe! No kidding. This truly opens up a whole vista of possibilities in the microcomputer market. It constitutes a *major* innovation by Radio Shack.

All programs for OS-9 are written in position independent code, allowing advanced memory management. Programs are loaded into memory only when needed but the user maintains the option of making them memory resident. Approximately 48K of user memory remains after the shell, drivers and screen memory. Programs are loaded into the top part of memory and data occupies the bottom part. Both are dynamically allocated and expand toward the center as required. Several programs can be in memory at once and even executed at once. Due to a combination of memory management and multi-tasking, multi-user programs are a reality.

#### FILMASTR

The Color Computer has a powerful ally in FILMASTR. This is a DATA MANAGEMENT SYSTEM that you can trust. FILMASTR combines the best features of the big systems to provide a combination of speed, power, and ease of operation that can't be beat.

YOU are in complete control of this friendly program with no programming knowledge required. You design the data screen with up to 20 fields by moving the cursor on screen with the arrow keys and typing in the field names. FILMASTR takes care of all of the rest.

Enter data by just filling in the blanks. This form fill-in is easy and natural to use. You can even copy data from the previous record with one key-stroke. Add records, delete records, change records without fuss.

Tell FILMASTR to sort your file on any field that you want or to retrieve a particular file and the job is done with super-human machine language speed. FILMASTR will find a single file or a group of files that meet your request and will save those records as a separate file if you want to.

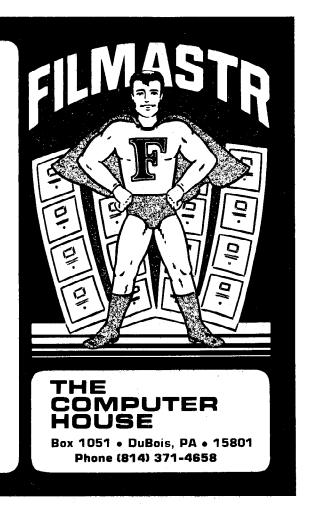
Controlled printing formats? Of course! Tell FILMASTR which records to use, which fields to print and in what order. You can control the print location to any position on the page. Mailing labels? You bet! All commands are given to FILMASTR with single keystrokes. Press the HELP key (BREAK), and the available commands are displayed. Make your choice from the menu and let FILMASTR do the work. FILMASTR can store up to 255 characters in each record and up to 24,000 characters in each file. (9000 with 16K).

FILMASTR

16K or 32K EXT BASIC TAPE \$29.95 DISK \$34.95 AMDISK \$39.95

RAINBOW CERTIFICATION SEAL

Add \$2.00 Postage & Handling • C.O.D. \$2.00 Additional PA Residents Add 6% Tax



#### Commands

A list of commands is given in Figure 1 with a short description of each. As you can see, most are standard disk commands you would find in other DOS's. Excellent documentation provides information on the use of each command with examples. I'm sure these commands will be explored in detail in future *Rainbow* articles.

#### Editor, Assembler and Debug

As OS-9 is machine language oriented, a cry of joy was detected at the sight of a standard disk-based Editor-Assembler for the Color Computer. Both have full MACRO capability, are user friendly and have excellent documentation. Calls to the OS-9 system are made by the use of interrupts (SW12) followed by a descriptor. All of the system calls are contained in a MACRO directory named DEFS. For this reason, an assembler is a necessity. The assembler accepts all of Motorola's directives and pseudo-operations and instructions are given in writing assembly language programs in an OS-9 format.

The debug module is excellent. In addition to an expression calculator, the program offers breakpoints, register examine and find commands among others.

### **Summary**

As you can tell I am enthusiastic about the possibilities of OS-9. Excellent software is already available. Look in the ads this month. I'm sure Radio Shack will support this system especially in the areas of small business and engineering, areas which up until now have been avoided. I like the



idea of the DOS being available to everyone along with the keyboard upgrade kit. Awesome!

### **Command Summary**

Attr Backup	Change file attributes Make disk backup
Binex	Convert binary to s-record
Build	Build text file
Chd	Change working data directe

Change working data directory
Change working execution directory

Cobbler File comparison utility
Make bootstrap file
Copy data

Date Display system date and time Check disk file structure

Del Delete a file

Deldir Delete all files in a directory system
 Dir Display Display Converted characters

Dsave Generate procedure file to copy files

Dump Formatted file dump Echo Exbin Convert s-record to binary Initialize disk media

Free Display free space on device Ident Print OS-9 module identification

Kill Abort a process

Link Link module into memory
List List contents of disk file
Load Load module(s) into memory
Timesharing system log-in
Makdir Create directory file
Mdir Display module directory
Merge Copy and combine files

Mfree Display free system RAM memory
OS9Gen Build and link a bootstrap file
Printerr Print full-text error messages

Procs Display processes
Pwd Print working directory
Pxd Print execution directory

Rename
Save
Save mcmory module(s) on a file
Setime
Activate and set system clock

**Setpr** Set process priority

Sleep Suspend process for period of time

Shell OS-9 command interpreter

Tee Copy standard input to multiple output paths

Tmode Change terminal operating mode

Tsmon Timesharing monitor Unlink Unlink memory module

Verify Verify or update module header and CRC Xmode Examine or change device initialization mode



*Hint* . . .

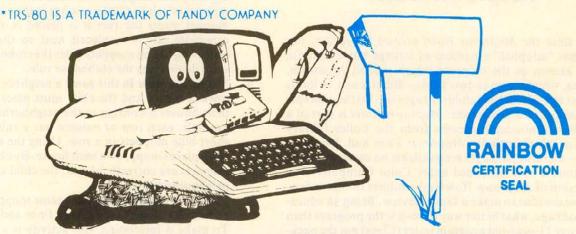
### **Automatic Lower Case**

To move automatically into lower case, type *POKE* 282,0. To return to upper case, use *POKE* 282,1.

-Ken Ostrer

### NEW for the Color Computer TRS-80

### **COCOCASSETTE** SUBSCRIPTION SOFTWARE



ENJOY A MONTHLY COLLECTION OF 8-10 PROGRAMS! Including games, education, home finance and more; on cassette for as low as \$5.00 a month! Add some action and imagination to your Color Computer... Best of all, we do the work!

### LOOK AT SOME OF THE LETTERS WE RECEIVED FROM OUR SUBSCRIBERS.

"I just thought I'd let you know that your cassettes arrive in good order, load just fine, and I really enjoy your programs!"

MARION, OHIO

"I was extremely impressed by the first tape I received from you. The added extras are just super."

WILLOW GROVE, PENNSYLVANIA

"Seldom do I ever write a fan letter. Usually if something is good, nothing is ever said. I just renew the subscription or buy

the product instead. T&D is an exception. I subscribe to several cassette computer magazines. Yours is certainly the most creative. The covers are original and clever. The material covered is excellent!"

PINE BLUFF, ARKANSAS

"I only entered a six-month trial but am already willing to extend my subscription!"

OOLTEWAH. TENNESSEE

-PRICES-

1 YR (12 ISSUES) . . \$55.00

6 MO (6 ISSUES).. \$30.00

SINGLE COPIES. \$ 6.00

-MICHIGAN RESIDENTS: ADD 4% TO ORDER -OVERSEAS: ADD \$10.00 TO SUBSCRIPTION AND \$1.00 TO 616 396-7577

SINGLE COPIES.

PROGRAMS ARE FOR EXTENDED BASIC MODEL ONLY. ISSUES ARE SENT FIRST CLASS.

SUBSCRIPTION SOFTWARE



IMMEDIATE SHIPMENT!
PERSONAL CHECKS WELCOMED!
SEND CHECK OR MONEY ORDER TO:



T & D SOFTWARE P.O. BOX 256-C • HOLLAND, MICH 49423

### Bibbits and Gribbits in Moptown Hotel

Ever since the *Moptown Hotel* arrived for review, our family has "adopted" a number of strange but wonderful critters known as the moppets which inhabit Moptown. Moppets, which come in two kinds—Bibbits and Gribbits are a real way of teaching children (ages six-13) the concepts of similarities and differences. *Moptown Hotel* is part of a series of educational programs from the Follet Library Book Co. which includes *Moptown Twin* and *Moptown Parade*—all three packages are available on cassette or disk and require a 16K Extended BASIC Color Computer. The disk version of *Moptown Hotel* is the subject of this review, which we decided to make a family review. Being an educational package, what better way to review the program than to have our 11-year-old program tester (Chris) put the package through its paces.

The Moptown series starts with games involving simple comparisons including the recognition of common similarities or differences between moppets and progresses through various games leading to the Moptown Hotel which develops higher level problem solving concepts. Thus, Moptown Hotel is designed for the latter half of this age group. Those with children six to eight would do best with the first programs mentioned earlier.

Moptown Hotel consists of five separate activities. With the simplier activities, the child is presented with the task of analyzing differences and similarities between moppets using defined rules. Later activities require the child to determine the rule based on observations. All moppets can be described by four traits namely: height (short or tall), weight (thin or fat), color of clothes (blue or red), and type (Bibbit or Gribbit). The five activities which range from easy to hard are: (1) Secret Pal; (2) Change Me; (3) Club House; (4) Moptown Map; (5) Moptown Hotel. The first two games are done in low resolution graphics (semi-graphics mode) while the remaining games are in four-color, hi-res graphics. A brief description of each game follows:

- 1. Change Me: This game requires the child to change moppet #1 into moppet #4 by changing traits according to the rule, i.e., change either one or two traits at a time.
- 2. Secret Pal: This game is similar to the popular game Mastermind. The child must guess the secret pal by naming its traits. The computer draws the moppet

Now YOU can create custom
overlays for your programs
USEABLE ON BOTH SIDES—ACCEPTS PENCIL OR INK-4 MIL MYLAR

BLANK KEYBOARD OVERLAYS

POR THE TRS-8Q, Co.C.
PO. Box 982
SIMPS ON VILLE, S.C. 29481

Add 100 to all orders for shipping & handling
STRESHOPTS add 4% Sales tax

Those Man Tensy C.

- according to the specified traits and places one yellow mark for each correct trait but does not inform the child which traits are correct. Through a process of deduction, the secret pal can be guessed.
- 3. Clubhouse: The idea of this game is to guess the membership rule for which moppets can enter the clubhouse, e.g. only blue moppets. The child rescribes the traits of a moppet which he thinks belongs in the clubhouse. If the moppet meets the rule it is placed in the clubhouse; otherwise, an X is placed next to the moppet. By observing which moppets enter the clubhouse, the child soon determines the clubhouse rule.
- 4. Moptown Map: In this game a neighborhood of Moptown is drawn and the child must place moppets into their houses according to the neighborhood rules. For example, each row or column has a rule such as only short blue moppets in a row. Using the arrow keys the child places moppets in each house. By observing which moppets are correctly placed, the child soon learns the neighborhood rules.
- 5. Moptown Hotel: In this final game moppets are assigned to hotel rooms according to floor and column rules. To make it interesting, this activity is a game for two children. Each child earns "money" by placing the correct moppet in a room next to occupied rooms. Before starting the game, the children may decide the hotel rules within the limits of one to three trait differences per row or column.

All of the programs ran smoothly with no hitches. With the disk version, operation is controlled by a master menu. At any time control can be returned to this menu by pressing the CLEAR key; however, in each case one can return to the program by answering "no" to the prompt to continue. This prevents accidentally cancelling the program by hitting the CLEAR key. Instructions are provided in each program at the beginning and also when the "?" is pressed. This, of course, avoids the need to refer to the manual. It should also be noted that very little typig ability is required of the child. Other than typing his/her name, only one key responses are required by the child, e.g., S or T for short or tall.

From our discussion thus far it is obvious that the Moptown series is designed to teach the concepts of deductive reasoning. Deductive skills are enforced by using the concrete example of the moppet to deduce an abstract rule. The use of the moppet characters rather than abstract geometric shapes, for example, makes the process of learning so much more fun. Children can identify with the moppets in houses or clubhouses or hotels, etc. much more easily than trying to distiguish between abstract shapes.

The documentation is sufficient since the instructions are included in each program as noted above. However, there might have been more discussion for parents on the concepts of logical thinking. This would help parents to provide guidance to their children. For example, the manual suggests making a deck of moppet cards with some possible games. This is an excellent idea which allows the learning process to continue while mom and dad use the CoCo to blow up space nasties. Overall we rate the *Moptown Series* as excellent—you can tell your child you're buying a game and he/she will never know it's really an educational game.

(Moptown Hotel by Follett Library Book Co., 4506 Northwest Highway, Crystal Lake, IL 60014, tape \$30, disk \$35)

-Pat, Don, and Chris Dollberg

### WE DO BASIC BETTER!

### **Experience High Resolution Graphics** and Speed Unsurpassed in Color Computer Extended Basic Software

### **GALLOPING GAMBLERS**

Those who have tried it agree that GALLOPING GAMBLERS is so addictive, so exciting, that you and your whole family will sit cheering for your horse to

No joysticks are required for this 4 player game. Place your bets on the variable odds and then wait for the sound of post time...and...they're off.

Game includes color graphics with score and birds-eye view of the race track. Can you last all twelve

We dare you to try.

\$18.95

### GATOR ZONE-

is the first video computer game that takes a "byte" out of the Preppy craze! You can finally get even with those pesty lry League anobs by blasting away at a host of Preppy Gators on their home planet of "Preptune". You have to be quick, or the gators will gobble up your shirts! This is comic arcade fun at its best. includes high-resolution graphics, on-screen scoring, joystick action, and three levels of play.

An IMB original!

STAR SIEGE PLUS-Discusted with Space Battle games in which your space craft looks like an asterisk? STAR SIEGE lets you and your friend (or enemy) pilot

two high resolution space ships while trading laser blasts. The first to take ten hits loses, but watch out for that pesty allen sauceri He wants to see to it that you both get vaporized.
Also includes two player TANK TORCHER game.

\$18.95

### **METEOR STORM-**

If you are bored with space obstacle games that place you as a distant observer from a point far off in space, then METEOR STORM is for you. Enjoy the thrill of blaating the approaching meteors from the cockpit of your own spacecraft. Watch the meteors grow in size until. . . !

18K Color Extended Required. Includes sound enhanced leaer blasts, multi game scoring, and three levels of play.

\$12.95

SELECT-A-GAME-combines 3 of IMB's finest bonus games in one sim-ple load! You can switch back and forth from "ALPINE ALIENS", "OH, GOBI", and "ZELDA'S BAT BOTTLE", All contain stunning color graphics and high speed action. Even if you already own one or more of these games, you will want this fine package.

\$18.95

### MICRO-MATH SKILLS QUIZ-

is a fine math drill for students at or below the 3rd grade math level. Includes automatic grade tally, and INKEY entry with large print, high-resolution graphics. This is a must for educators!

\$12.95

### CREATAVADER-

Now you can design your own "invader-style" game for your Color Computer, includes all the routines needed for customizing the creatures you hate the most. Full instructions included. Create your own targets or select from a menu of seven predesigned four color targets.

\$18.95

### COLOR WORDCLONE-

Turn your Color Computer into a supertypewriter. Screen displays 50 characters by 23 lines in real up-per and lowercase. User modifiable. Remove our character generator and use it in your own basic program. This is an easy to use word processor. character generator alone is worth the price of the tape. Works with tape or disk.

### KOSMIC KAMIKAZE-

Our best selling high-resolution, deep space areade game which the RAINBOW called "...the best spaceship graphics we have seen in a non-machine language program." Battle high speed alien saucers, decoy ships, bonus killer crafts and speeding comets.

\$18.95

### STAR*TRENCH WARFARE-

This High Resolution Color Game has the most elaborate graphics of any Color Computer Game created to date. You'll be amazed by the remarkable speed and flicker-free animation found in this graphic space challenge. Program includes a moving trench, cockpit perspective, on-screen rapid scoring, energy and ship gauges, automatic high score tally, joystick control, and a recharge and crash sequence you'll have to see to believe. Use your own 3-D glasses and add an amazing sense of depth to this classic game. Truly a must for every Color Computer.

\$18.95



### STARBASE ATTACK-

Why be a loser? Here's an arcade game you can play to win. In other space city defense games you play until you lose. STARBASE ATTACK is totally different. Your mission is to clear a path for the escape vehicles which will carry your people to safety. Not only that, but you must also maneuver your own escape before allen warheads or a wave of killer asteroids level your dome-covered cities. You control high energy laser blasts and expansion shields, but watch out! You might end up the one who doesn't escape

\$12.95

SUPER DISC WITH ALL 11 PROGRAMS A VALUE OF \$171.50 JUST \$59.95 POST. PAID.

### LUSTRATED MEMORY BANKS

(A DIVISION OF THE PROGRAMMER'S GUILD, INC.

P.O. BOX 74

WEST PETERBOROUGH, NH 03458

 ◆VISA AND MASTERCARD ACCEPTED CALL (603) 924-6065 3-7 P.M. EST



MENTION THE RAINBOW AND SELECT ONE FREE PROGRAM FOR **EVERY TWO \$18.95 PROGRAMS YOU ORDER.** 

# DANGER RANGER



What's blue and red, about an inch tall, able to leap across a Color Computer video display in a single bound, and destined to put lnky, Winky and Stinky out to pasture?

**Danger Ranger,** the newest character from **ScreenPlay.** That's who.

**Danger Ranger** isn't a clone of some moldy arcade game. It isn't like any video game you've ever seen. It's faster. More challenging. More **fun**.

Your joystick controls Danger Ranger on his mission to make the universe safe for Mom, Brotherhood and The American Way. First, our hero finds himself in the surrealistic 'Chamber of Pasha,' which consists of five consecutive platforms. Danger Ranger has to blast his

way through radioactive bats and roving eyes to pick up the ten keys that may spell the difference betwen survival and death for the human race!

If Danger Ranger can muster enough skill and courage to survive those challenges, he'll enter the 'Acid Chamber.' Here, not only do demons guard the treasure boxes he wants to collect, but fatal drops of acid fall from the ceiling and rise from the floor. Not a nice way to make a living - but it makes one heck of a video game.

### Danger Ranger, from ScreenPlay.

Poor Winky. Lucky you.

16K Tape ......\$24.95

No Extended Basic Required

ScreenPlayTM 1-800-334-5470

P.O. Box 3558 Chapel Hill, NC 27514

Radio Shack and Color Computer are trademarks of Tandy Corp

### **Beyond Words**Is Beyond Words

Beyond Words consists of three separate language arts tutors from Computer Island written for children and young adults, grades three through 12. After CLOADing this 32K Extended BASIC program, the user must ENTER PCLEAR I before proceeding to RUN. At this point the student is asked to enter his/her name and tell if the printer is turned. on. The child then chooses one of three subtests. Each is a three-part, menu-driven program and the user can practice one skill and then go on to another at the end of a round. The incorrect questions and answers are displayed, and if the printer is turned on, a list of items to study is generated. If a particular subtest is used for five rounds, a total score is given.

Beyond Words 1, 2 and 3 are written for children in grades three to five, grades six to eight, and grades nine to 12 respectively. All have spelling subtests in which a correct and an incorrect spelling of a word is given. The child then types in and ENTERs the word that he thinks is spelled correctly. Fourth graders who tested it really liked the idea of having to type in a word, rather than keying in the number of the answer. That age groups seems to enjoy a program that allows them to use the computer as much as possible.

A second subtest in each program deals with antonyms and synonyms. In this part, two words are shown. The child has to decide if the meaning of the words are the same (S) or opposite (O).

It is the third subtest that is different in each program. In

Hyperion Software presents

TREKBEST

The <u>BEST</u> 'Trek' game ever!!!

INTRUDER ALERT!

Can YOU outsmart the Robots???

Both games with multiple levels, and Realtime, Fast Action lowres graphics! Each for only .... \$16.95

-- The BEST in Adventures --

** THE NECROLOGUE TRILOGY **

A Three program Adventure!!!
All Three 16k programs.....
for only \$17.95

THE QUEST FOR THE STAFF OF LLORINAR

*** Book I Parts 1&2 ***

Both parts (2 16k programs) for 13.95 (Parts 3&4 coming soon!)

All prices include P. & H. NY State residents please add app. sales tax.

HYPERION SOFTWARE

P.O. Box 196
Lagrangeville, NY 12540

Beyond Words 1, it is short forms. This subtest covers abbreviations and contractions. The long form is given and dashes are shown to indicate the length of the answer. The child is then to type in the short form. In Beyond Words 2, there is a subtest in homonyms. A word is given, and again dashes indicate the length of the answer. The child has to type in a word that sounds exactly like the given one.

Beyond Words 3's third subtest is analogies. Two pairs of words are given and the user has to decide if the relationship of the first pair is the same as the relationship of the second pair. In other words, is the analogy true (T) or false (F)?

All three programs have 400 questions each. The questions are randomly selected and in our testing, we found hardly any repeats with each loading.

The words used in the program arc all contained in *DATA* statements. The documentation suggests that the program can be modified by the user and gives very complete directions on how to change the *DATA* statements so the program's use really becomes infinite. The modification directions are clearly written and very easy to follow.

We had many children of all different ages use the program that was suited to their particular age group. The reactions and comments about the programs were all very favorable. All of the children, especially the younger ones, enjoyed the amount of interaction that they had with the computer. My daughter, Shari, who is in the eighth grade, found the subtests for her level very challenging. Very often she complains that "educational" software written for her age group is too easy.

(Computer Island, 227 Hampton Green, Staten Island, NY 10312, tape \$19.95 each)

-Stephanie Snyder





### SPIKE-SPIKER® ...THE SOLUTION!

Protects, organizes, controls computers & sensitive, high tech electronic equipment. Helps prevent software "glitches", unexplained memory loss, and equipment damage. Absorbs damaging voltage spikes & surges, reduce costly equipment downtime. Filter models attenuate conducted RF interference. 120V, 15 Amps. Other models available. Ask for free literature for detailed specs. Call your order in today!



### DELUXE POWER CONSOLE \$79.95

Transient absorber, dual 5-stage filter. 8 individually switched sockets, fused, main switch, and lite.

QUAD-II \$59.95

Transient absorber. Dual 3-stage filter. 4 sockets, lite.

QUAD-I \$49.95

Transient absorber, 4 sockets, lite.

MINI-II \$44.95

Transient absorber, 3-stage filter, 2 sockets, lite.

MINI-I \$34.95

Transient absorber, 2 sockets, lite.





Use your credit card or send check & we pay the shipping.

215-837-0700

6584 Ruch Rd., Dept.RB Bethlehem, PA 18017 Out of state, order toll free 800-523-9685 • TWX 510-651-2101

PA Res. add 6% sales tax  $\bullet$  for COD add \$3.00 + shipping  $\bullet$  dealers invited

### **Phonics I:** Teaching Tool With Limitations

Phonics I is an attempt to use the computer, combined with a voice track on tape, to teach the initial consonant blend sounds of words. The tape version, which I received for review, consists of two tapes, one a tutorial, the other a test. The computer is used to synchronize the playing of the cassette recorder with the screen display. I presume the disk version is similar.

In the tutorial, a pleasant male voice first pronounces the blend and asks you to repeat it after him, while the letters which make the sound are shown on the screen in large lower case. The voice says, for example, "Blue starts with bl." This is repeated for 22 separate blends.

Due to the sequential nature of such a presentation it is impossible to isolate only a few sounds for study at any given time, nor can the order be changed. This severely restricts the usefulness of the tutorial as a teaching tool, as the usual practice is to first master a few sounds and then proceed to new material.

The student might be better served in the initial learning stage by a simple voice tape combined with an illustrated booklet showing the letters, and a few words in which the blend occurs. Such tapes are easy to prepare, and most children are familiar with the use of a beep tone to indicate that the page is to be turned. Only after the child is familiar

### "SEE" MUSIC!!

•The KALEIDOPHONE allows your Color Computer to ''listen to'' your hi-fi and display what it ''hears'' on your TV!

 Dedicated hardware lets the computer devote full-time to creating the displays, so breath-taking, animated pictures in full color are easy to program.

• Just plug the KALEIDOPHONE into hi-fi and joystick inputs.

 Do not confuse with imitations — the KALEIDOPHONE continuously delivers actual volume signals (64 levels in stereo). Works on any CoCo (16K recommended).

KALEIDOPHONICS, our users' newsletter (FREE with purchase) contains dozens of new display ideas in each issue — a literally infinite variety of patterns is possible!

•The KALEIDOPHONE is something really new. Great for parties! Educational too! Order Now!

•Only \$49.95 fully assembled including detailed instructions. BONUS: free issue of KALEIDOPHONICS on cassette!

NEW SALEM RESEARCH
West Main Street
New Salem, Mass. 01355



Write for free sample program!

with most of the blends used in this program would the computer tutorial be helpful for review and reinforcement. Some children do have great difficulty associating spoken sounds with the printed word, and for them it is helpful to have a variety of audio visual methods available. The excitement of using the computer for this type of task may provide that extra boost to learning needed.

The testing program is very similar to the tutorial program. The tape voice first explains that the child is to wait for the appearance of a large question mark on the screen before answering. Then the tape voice says, for example, "What are the first two letters in the word black?" (All words used are different from those used in the tutorial portion.)

When the question mark appears, the child is to key in his response. That, for the young child, is easier said than done. It takes the inexperienced child a very long time to find the correct two letters. Unfortunately, he is deprived of the thrill of seeing his work on the screen, for what he keys in is not displayed. No provision is made for him to correct his answer in case he hits the wrong key, or hits two adjacent keys simultaneously. If he does succeed, he is rewarded with a happy face, and if his response is incorrect a sad face is shown and a low tone sounds.

The children who tried the program for me were disappointed that they could not see what they had typed in, but were very happy when they were correct. After the appearance of one of the two faces, the correct two letters are shown. The non-punitive nature of computer testing and drill programs does encourage repetition until success is achieved, but here, where the same words and the same order must be followed, a child who works with it many times may memorize the order of responses, rather than learn the material.

The limitations inherent in this type of program suit it best, in my opinion, to the child who has already learned most of the blends presented, but who needs an extra push. At the present time, when using a computer is, for many, rewarding in itself, this program may help. Although the documentation accompanying the program asserts that it is designed to tutor children in basic reading skills, it might have application in the teaching of spoken English to the foreign born, for whom letter recognition and typing are less problematical.

(Prickly-Pear Software, 9822 E. Stella Road, Tucson, AZ 85701, \$24.95)

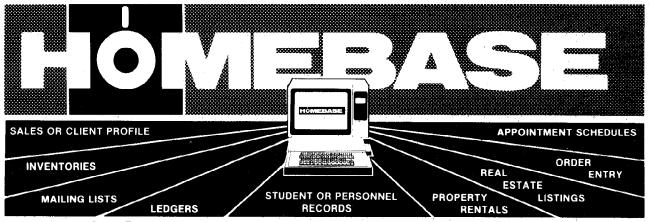
-Carol Kueppers

Hint .

### Print Out Disk Directory

If you have a long disk directory and want to see all of it, or if you simply wish to have a hard-copy print-out of your directory, one simple command will allow you to do this easily.

Just POKE 111,254:DIR and the entire disk directory will appear on your printer, even it if is too long to be fully displayed on the screen.



### * * * MORE THAN JUST A DATABASE * * *

Turn your TRS-80 Color Computer into a powerful business machine. Create and manage customized records for innumerable home and office applications. HOMEBASETM data management system goes beyond just storing, sorting and retrieving your business records. It allows you to use the same data records in calculations and in printing form letters and reports. The HOMEBASETM text processing system is both a word processor and a complete filling system. Store 250 screens of text as data records and then use any portion of a record for searching, sorting, or for printing form letters and special reports.

HOMEBASETM is an invaluable tool for managing a business involving insurance sales, real estate sales, property rentals/management, mail-order sales, or any comparable business. Using HOMEBASETM, both accounting and non-accounting applications are easily automated to save you time and provide better information about your business. Create customized ledgers or extend your payable and receivable records to include descriptive data important to the daily operation of your business as well as its continuing success.

HOMEBASETM is a menu driven system and does not require programming. The system documentation includes descriptions of every menu option and is uniquely designed for quick referencing. System documentation includes a tutorial and demonstration program.

### \$35

### **DATA MANAGEMENT**

• 50 data fields • Formatted dates, time of day; phone numbers, & dollar amounts · 24 scratchpad data fields not stored within any data record • Variable-length alpha/text data fields . Reorganize records using move or ascending/descending sort on any data field • Manage files using search/select, delete, clear, duplicate or list . Perform calculations on any numeric data using add, subtract, multiply, & divide • Print using automatic formatting with options to print report titles, page numbers, record names and data names . File Utilities include generate, merge, duplicate, summarize, cassette backup/reload, rename, delete, directory display/print and moving data between files.

### \$15

#### **CUSTOM REPORTING**

• Merge data management files with text files • Create and store form letters and report formats • Print each data record as one letter or report • Print selected records as a single report/list • Change the print field size for any data field • Use a single report for different files • Print multiple copies.

### HOMEBASE

### SYSTEM REQUIREMENTS

TRS-80 Color Computer with 32K; Disk Basic; and one disk drive. 2 Disk drive option is included - NO EQUIPMENT MODIFICATIONS REQUIRED.

### \$25

#### **TEXT/WORD PROCESSING**

• 250 screens of text • Reorganize text records using move, copy, or ascending/ descending sort . Manage text files using search/select, delete, clear, duplicate, move or list . Print text record appearing on the screen to review before final printing or print all of a selected group of records . Format using embeded printer controls for paging, skipping lines, and changing fonts . Program printer controls include right & left margins, lines per page, page width, horizontal tabs, page heading, page numbering, line spacing, and multiple copies • File Utilities include generate, merge, duplicate, synchronize, cassette backup/reload, delete, rename, and directory display/print.

### TURN YOUR COLOR COMPUTER INTO A POWERFUL BUSINESS MACHINE TODAY. ORDER TOLL FREE 800-334-0854

Credit card holders call toll free: 800-334-0854, extension 887. In North Carolina call: 800-672-0101, extension 887 or send check or money order to:

<code>HOMEBASETM</code> is a trademark of <code>HOMEBASETM</code> COMPUTER SYSTEMS, a subsidiary of Small Business Systems, <code>Durham</code>, NC, (919) 544-5408. TRS-80 is a trademark of Tandy Corp.

HOMEBASETM COMPUTER SYSTEMS P.O. Box 3448, Durham, N.C. 27702

### 90 day warranty

NC residents add 4% for sales tax. Allow 1 to 3 weeks delivery.

### **VDOS**The Case Of The Hidden Disk

By Frank J. Esser

The word virtual means that an item takes on an appearance of something other than what it really is. The term "virtual memory" has been used to describe the manner in which some of the large mainframe computers handle memory mapping. However, as the 16-bit professional computers become more sophisticated, the term will start to be applied to them also. In the case of the large mainframes, the term virtual memory referred to the fact that the programmer had available to him more memory in which to run his program than was apparent. In the case of a couple of vendors, his program, in essence, could be as large as the disk that stored them and still run. To the programmer it appeared as if he had all the memory he could ever wish for. How does that apply to VDOS, you ask? Well,



#### AUTOTERM

TURNS YOUR COLOR COMPUTER INTO THE

### WORLD'S SMARTEST TERMINAL!

YOU'LL ALSO USE AUTOTERM FOR SIMPLE WORD PROCESSING & RECORD KEEPING.

### **EASY TO USE**

ON-THE-SCREEN EDITING via cursor. Full prompting. Scrolling. Key Beep & Error Beebop.

### PLEASANTLY POWERFUL

Total communications ability at 110 to 1200 baud. Transmit text, graphics, BASIC and Machine Language. Save & Load cassette/disk files while on line. Scan/Edit current data while receiving more data. Use any modem. Fully supports D. C. Hayes & others. Use any printer, page size, margins, line spacing. Override narrow text width of received data. Imbed printer controls.

### TRULY AUTOMATIC

Automate almost any communications activity. Dial via modem, sign-on, interract, sign-off. Perform an entire session. Act as a message taker. Keystroke Multipliers may include parameter changes, editing, time delays, execution of other multipliers, looping, waiting for partially specified responses, and branching based upon alternative responses. Self-test mode.

### 32K MEMORY RECOMMENDED

CASSETTE \$39.95 DISKETTE (coming soon) \$49.95

Add \$3 Shipping & Handling

MC/VISA/COD

PXE Computing 11 Vicksburg Lane Richardson, TX 75080 Eves. & Weekends: 214/699-7273 Weekdays: MICRO CONCEPTS 214/458-0330 VDOS provides the user with a virtual disk system. VDOS will take half of user memory for the disk system data storage. This means that in a 32 or 16K system, you will loose half of the available memory to the system. However, if you have a 64K system, VDOS will take the 32K of memory under the ROMs and use it. Thus the user will only loose the 2K needed to hold the VDOS system itself. If you already have a disk drive, VDOS can be used as a supplement to it and is completely compatible with it.

VDOS comes on a cassette tape and is autoloading. That is, you are required to only type in *CLOADM* and wait. VDOS requires a 16K, 32K or 64K computer and a cassette recorder. Extended BASIC is not required. The documentation consists of 16 pages of single-sided, typewritten material. The manual is well-written and easy to follow. It took me approximately five minutes to get VDOS up and running. The first section of the manual is devoted to explaining just what VDOS is and what it will do in very general terms. The second section is the introduction. It is devoted to giving the user a more in-depth description of VDOS. The third section is a tutorial on the use of VDOS and will walk the user through all its functions. There is an appendix which contains the necessary information which explains how to force VDOS to reserve more than half the available memory if one so wishes. Also included is the manner in which VDOS can be disconnected if and when the user wishes to do so. The last section is a quick reference section listing the VDOS commands and how to use them.

Placing the cassette in the recorder, typing *CLOAM* and waiting will produce the start-up message for *VDOS*. The message is:

VDOS 1.0 COPYRIGHT (C) 1983 BY DR. PREBLE'S PROGRAMS TYPE VDOS (ENTER) FOR MENU

### END OF USER MEMORY=32642

Typing VDOS ENTER gets the main menu which has the following format:

#### VDOS Menu

- 1) DIRECTORY
- 2) SAVE BASIC PROGRAM
- 3) LOAD BASIC PROGRAM
- 4) SAVE BINARY FILE
- 5) LOAD BINARY FILE
- 6) KILL A BASIC PROGRAM
- 7) KILL A BINARY FILE
- 8) EXIT TO BASIC

Let us examine each of these commands individually. The DIRECTORY command works much like Radio Shack's disk BASIC command *DIR*. Exercising this option will display the programs already cataloged (stored) on the memory disk system. The printout has the following format:

**VDOS DIRECTORY** 

TYPE NAME

SIZE

LOAD

EXEC

BAS: CCCALC 7261

### 30407 BYTES REMAIN FOR STORAGE PRESS ANY KEY TO CONTINUE

The load and size categories are for machine language programs.

### Double Denzity Software

### Double Denzity Software

### COLOR TERM + PLUS +

An Intelligent Terminal Program For The Color Computer or TDP 100.

- Communications BAUD rate: 110-19200
- Change printer BAUD rate: 600-9600
- Select printer line feeds if needed
- Select Half or Full Duplex
- Select Odd, Even, or No Parity
- Select 7 or 8 Bit Words
- Select 1 or 2 Stop Bits
- Send Control Characters
- Separate Keys for Escape & Delete (Rubout)
- Turn off those UGLY Lower-case letters
- Word Wrap eliminate all split words
- Selectable Reverse or Normal Video
- Scroll protect up to nine lines
- Automatic capture of incoming files
- Send one line at a time from your buffer
- Has programmable prompt for "send next line"
- Disk version extras: List Directory, Granules
- **Buffer Size Indicator**
- Complete up and down load support
- Improved buffer editor in both versions
- On/Off Line Cassette/Disk Reads & Writes
- Save & Load Machine Code, BASIC Programs or Files
- On/Off Line Scrolling of Buffer
- Pre-enter Data before going on line
- Easy to read manual is included with each program

PRICE \$29.95 (Tape) \$39.95 (Disk) 16k or 32k Req.



COLOR BIORHYTHUM Are you up or down today, tomorrow, or years from now? Find out with COLOR BIORHYTHUM. Uses high res graphics. Send the chart to printer. 16k or 32k Ext. BASIC Req. PRICE \$14.95 (tape)

DD CLOCK Don't forget what time it is when you are programming. The time is displayed in the upper right corner of your screen. Shows hours, minutes and seconds. Beeps every hour. 4k, 16k, or 32k. PRICE **\$9.95** (tape)* Ext. BASIC not required.

#### -NEW PROGRAMS-

### DOUBLE DOS

Do you have the 35 track disk blues? If you have 40 or 80 track drives, you are really in need of this program! DOUBLE DOS allows the user to use 35, 36, 40, and 80 track drives from BASIC. ALL COMMANDS are supported with DOUBLE DOS, even direct track and sector access! (DSKI\$0,39,18,A\$,B\$ is accepted by DOUBLE DOS!) You can reconfigure the system any time you want to, without reloading! The system is totally transparent to BASIC! DOUBLE DOS does require that you have a 64K system in order to use it. This program does not require the FLEX operating system!

PRICE \$24.95 (Disk) * D Order DOUBLE DOS and ROM MOVE and pay only \$29.95!

New and

Dealer inquiries

Improved!

Note: The AMDEK disk drives are 40 track drives, get 10 extra granules with **DOUBLE DOS!** 

ROM MOVE

Are you tired of having only 32K of memory when you have a 64K computer? ROM MOVE is just what you need! With ROM MOVE, you are given another 8000 bytes of room for your BASIC or Machine Language programs! You can switch from BASIC to EXTENDED BASIC to DISK BASIC easily. PRICE \$12.95 (Tape) * D (Ask about our 48K version) 64K required.

### FREE PROGRAMS!!

### HALF PRICE SALE!!

SUPER-PRO REPLACEMENT KEYBOARD KIT \$64.95

Savell

FREE PROGRAMS!!
iet a FREE utlity program when you buy a copy of CULOR KEY COMMAND! Your choice of CULOR DISK SAVER, DD CLOCK, SCPER
EERER, TAPE NAME, ALTOUADL, or CUISOR II. Save up to \$12365 COLOR REY COMMAND is only \$18,95 (Tape) * D.
AND THAT'S NOT ALL!!! Buy COLOR TERM - PLUS - and the SUPER PRO keyboard and pay only \$59,95 for the keyboard!
AMDEK DISK SYSTEM!! This is one of the hottest selling new thems to done along in years 4ME DISK DRIVE only \$49,00.
Save \$100,00!! Buy an AMDEK DISK DRIVE and our IS CONTROLLER together and pay only \$649,00! We'll throw in the cable FREE!!

ROM SWITCH
Change from BANC to EXTENDED BASIC, to DISK BASIC and back again with ROM SWITCH! You can even press the RESET button, and with nine POKE, restore the system! PRICE 49-05-64K required.* D.

OUBLE CABLE you are tired of switching cables every time you need to use your MODEM and PRINTER together, this is the fix! Only \$14.95

THREE GAMES FOR \$19.95!!
That's right, only \$19.95 for MONBIASE INVASION, CLONE ATTACK (requires 32K), and IAGO. Just ask for our Game Package, and get
two action games and one thought type program for only \$19.95, 16K EXT Basic required.

HALF PRICE SALE!!
Buy either MODEM CHESK, MODEM CHRCKEIS, or MODEM IAGO for HALF PRICE!! Each package contains two tapes, and two instruction booklets, Play a game over the phone? Now only \$19.95, 16K EXT Basic required ** D.

FREE PROGRAMS! Send 20 cent stamp for free catalog.

### DOUBLE DENSITY SOFTWARE



920 Baldwin Street Denton, Texas 76201 Phone 817/566-2004.







Tired of playing adventure games that have a limited vocabulary? Underground gives a detailed description of your surroundings, just like a main-frame adventure! There are over 90 separate rooms, passageways, etc. Discover what the mysterious machine does, what lies in the Egyptian sarcophagus, how do you tame the guardian of Hell's Gate, where is the fabled golden apple? Everything is up to you. You give the orders, you are the

hero. This adventure is not for the faint of heart! You can suspend your game at any time and continue later. Takes from 5 to 20 hours to play.

32K ext. BASIC Req. PRICE \$26.95 Disk only

COLOR KEY COMMAND

Looking for a powerful programmer's aid, but you don't have a fortune to spend? This program is for you! Look at these features: two keystroke entry of more than 80 Basic, Extended Basic, and Disk Basic commands. Select the color of your cursor. Select the prompt you want - no more "OK" when a program bombs! Automatic line numbering - you select the start line and increment! 4 custom programmable keys for a total of 64 characters each - enter whole lines with two key presses! Copy any line with the copy command. Merge tape programs together automatically. Redefine any or all keys with a short basic program we supply. How can you get all this and more for so little? Because you make the keyboard overlay! We give you a template with all commands printed on it - you cut it out and use it. That is all there is to it! Note: Not all features are available on every machine; some require Extended or Disk Basic to work properly.

16K or 32K Reg. PRICE \$18.95 (tape)* D

### GALACTIC MATH

Load this game into your computer and start playing! This is a math tutor that is really an arcade game! Keep those saucers from landing! There are no "happy faces" or "funny clowns" in this math program.

16K or 32 Ext BASIC Req. PRICE \$15.95 (tape) D

The SAVE BASIC PROGRAM option will store your BASIC programs in the system. The program must first be loaded into regular memory either from tape or disk. It can be RUN or just loaded, it doesn't really matter. When you are ready to save the program, type VDOS and press ENTER. VDOS's main menu will appear, wherein you select option 2. You are then asked for the filename you wish to use. Upon pressing ENTER, the return is almost instantaneous. In fact, the return is so fast that you may tend to think it did not work, but it did. Welcome to the world of bulk storage. Upon listing the directory contents, you will indeed see that your program has been cataloged.

The LOAD BASIC PROGRAM is just the opposite of the previous command. This option will fetch your program from the *VDOS* storage area and put it in the user memory area, ready to run. The response here is just as fast as the previous command.

SAVE BINARY FILE and LOAD BINARY FILE are the same as their BASIC counterparts, except that you must use the proper load procedures to get them into regular memory from either disk or cassette.

KILL A BASIC PROGRAM will do just that. If there is a BASIC program cataloged on the system, using this option will allow you to delete it.

KILL A BINARY FILE is the same as the above command except that it is used for binary files.

EXIT TO BASIC allows the user to return to the BASIC interpreter and proceed as if *VDOS* does not exist.

VDOS is a 2K virtual disk operating system which will make maximum use of your computer's memory. Although VDOS will work with any system, and I think there are

### YOUR SEARCH IS OVER

The Software Connection of Ft. Lauderdale is your one stop source for your Color Computer Software and Peripherals.

WE FEATURE A COMPLETE SELECTION OF SOFTWARE FROM MOST SUPPLIERS AT DISCOUNTED PRICES!

TDP (Tandy)
COLOR COMPUTER
16K Regular Basic

\$195

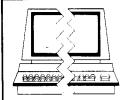
TDP (Tandy)
COLOR COMPUTER
16K Extended Basic

§295

64K UPGRADES (E/F boards) \$85 • (D boards w/1.1 rom) \$95

— SECS BOX (Serial Electronic Communication Switch) — Switch from printer to modem or other device without removing jacks from your computer With three outlets and pilot light to confirm transmission. \$39.95

Repairs done on all color computers at reasonable prices
When in Ft. Lauderdale be sure to visit our retail store.



### THE SOFTWARE CONNECTION, INC.

5460 No. State Rd. 7, Suite 108
Fort Lauderdale, (under the Loft Restaurant)
(305) 484-7547

many, many applications for the 16K and 32K systems, it really shines on a 64K system. VDOS will put to work that hidden 32K of memory that lies under the ROMs. The memory that just sits there doing nothing in most cases. VDOS has a command set which will allow you to load and save programs, delete both BASIC and binary programs and list the directory. There is a last command which will return the user to the BASIC interpreter; it remains invisible until you type the command VDOS. All BASIC functions perform as before. VDOS runs completely independently. It can be exited and reentered at will. It is not removed from memory until you remove it. Which is also a very simple procedure. There is no interaction between it and RS BASIC. VDOS is an excellent addition to any Color Computer library. It allows the user to store a number of programs in high memory, to be recalled and used at anytime the user wishes. I have three disk drives on line and use my system for many business applications. Most of these applications I wrote myself and I sure wish that VDOS had been available when I was developing and debugging them. It would have saved me countless hours of program swapping time. I see tremendous use for this system if properly applied. If yours is a cassette-based system and you have a number of programs stored on the tape you are working on, you know what a problem the management of those programs can be. Well, VDOS can take care of that for you. You can load the programs one at a time into regular memory and catalog them under VDOS. Repeat this procedure as many times as needed, provided there is sufficient memory available. When you have finished, simply reload them to memory from VDOS and resave back to tape. What could be easier? If you already have a disk system, VDOS will save the time required to load from disk since VDOS's response is almost instantaneous. In either case, there are some very definite advantages to using VDOS. Couple this with the fact that in a 64K machine it runs almost completely out of your way. You will give up only 2K of user memory to it.

In conclusion, I found VDOS to be a program of excellent quality and with tremendous potential. The author of VDOS promises that a set of utilities to expand its capabilities will be available in the near future. I have a couple of items which I would like to throw into the pot of future utilities. It would be nice if you could load and run a program under VDOS from another program, as can be done with RS Disk BASIC. Also, it would be neat if you could go directly from VDOS to tape or disk on a singular program basis. And perhaps a later version would be able to address one of the computer ports for greater storage capabilities. VDOS has limited storage, but with a little care, it should do the job very well. After all, 32K of programs is quite a bit. I believe that this program should be in the library of every serious CoCo user, whether you have a cassette or diskbased system.

(An accompanying utility, **VDUMP**, is now available from the author and will allow you to load or save an entire bank of programs with a single command.)

(Dr. Preble's Programs, 6540 Outer Loop, Louisville, KY 40228, \$49.95 plus \$1.50 s/h)

### Color Micro Iournal

5900 Cassandra Smith Rd. ★

Hixson, TN. 37343

**COLOR MICRO JOURNAL™** Is A Monthly Tabloid Publication for Color Computer USERS!

**

**COLOR MICRO JOURNAL™** is a Magazine FOR Color Computer Users BY Color Computer Users. Columns on various compatible Operating Systems, Languages, Uses (Bulletin Boards, Clubs, using the RS-BASIC, and so on), etc.

***

Programs - Games - Reviews - Education - Hardware - Software - New Product Announcements - Books

***

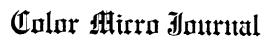
Get the MOST from your COLOR COMPUTER without being an Engineer.

DON'T MISS A SINGLE ISSUE
Subscription Rate of only \$16.50 a Year!!!

****

**COLOR MICRO JOURNAL**™ published by the ONLY pure 68xx, INTERNATIONAL Computer Magazine. '68 Micro Journal has provided coverage for over FIVE Years. We KNOW the Color Computer, the Software (both FUN and WORK) that IS and CAN BE run on it. We KNOW the products that ARE, CAN BE, or WILL BE used on the Color Computer.

For Ordering Subscriptions By Phone Call 1-800-338-6800



Limited Time Charter Rates

USA - \$16.50 per year. Canada & Mexico - \$23.00 per year

Surface Foreign - \$28.00 per year, Airmail Foreign - \$52.00 per year

"Color Micro Journal is a trademark of Computer Publishing Inc.

Yes! Start	my	copy	of	Color	Micro	Journal	coming	as	soon	as
possible!							9			

Address_____

City_____State___Zip____

☐ Visa ☐ Master Card ☐ Check or Money Order Enclosed

Card #______



Gathering information for a term paper? Preparing a report or lecture?

### Let Bibliography File Help With That Term Paper!

By Larry Konecky

tudents and teachers, here is a data program written specifically with some of your needs in mind. Bibliography information and related notes can be stored on disk for quick access and recall. Information is filed similar to a 3 x 5 index card record keeping system. Each record contains fields for entering a subject, tag, author, title, publication, volume or address, date, page numbers, and nine lines of notes. The subject, tag, and author fields are stored in a sequential file in alphabetical order by subject and by author within

Included are a variety of formats for accessing, displaying, and printing information contained in your file. Records may be accessed by subject, tag, or author, or any combination of the three. Records may also be accessed by specific title. Typing the word "ALL" in place of a specific title, subject, tag, or author will allow tabbing through all records under specific fields or combination of fields. Records displayed can be sent to a printer in one of two formats (bibliography information only or the complete record).

A listing mode provides various formats for listing accessible fields contained in your file. Subject field headings can be displayed or printed along with a



number indicating the number of records filed under each subject. Tags, authors, or titles under specific subjects; or tags, authors, or titles for all subjects may be listed. Tag and author modes allow selection of either screen or printer for listing while titles can be sent only to a printer. Another listing mode will list to a printer a combination of all subject, tag, and author fields.

This program is written for a 32K Color Computer with disk drive. It will not work as written with cassette as direct access filing is used to handle data. To make full use of the program a printer is necessary. (I use a Line Printer VII.)

A PCLEAR 1 is used to set aside RAM for program use. In the first RUN after your system is turned on this statement often causes errors. To alleviate these problems perform a PCLEAR 1 before your first RUN.

After RUN is entered the following "initial" menu will appear:

- 1) Continue Existing File
- 2) Begin New File (Disk)

If you are beginning a new disk, select 2. If you already have a file created on the disk in your drive, select 1. If you select 2 and then save a record to disk on a disk already containing records you will lose access to those records. Only select 2 if you are beginning a new file on a fresh disk or no longer have a need for records presently on a disk. You may want to create separate files (disks) for various subject areas if you expect a large collection of records. There is room for 140 records on each disk. It is helpful to have a copy of the program on each disk being used for a file.

After choosing to continue with an existing file the following "main" menu will appear:

- 1) ADD
- 2) SEARCH
- 3) LIST
- 4) END

(If you had selected to begin a new disk from the initial menu, you would automatically have been placed in the ADD mode.)

ADD allows addition of new records to your file and consists of four pages for entering information; one page for entering bibliography information and three for entering notes. The first page seen allows entering the following bibliography information by pressing indicated keys:

Key	Bib Info	Length
S	Subject	15
T	Tag	12
Α	Author	30
1	Title	80
2	Title continued	80
P	Publication or Publisher	30
$\mathbf{V}$	Volume or Address	30
D _i	Date	12
G	Page Numbers	15

Each field is limited to a specified amount of characters as shown in the right hand column above.

Notes are entered through each of the other three pages. Up to nine lines of 75 characters each may be used. Each line is entered by accessing its corresponding page and selecting a line number from one through nine (three to a page).

Below each page appears a menu of other selectable functions as shown below:

'C'=CONTINUE 'E'=DELETE 'K'=SAVE

'R'=RETURN 'L'=PRINT 'B'=BACK

Selecting between C and B allows movement between each of the four pages. If you press C on the fourth page you will be asked if you want to save the present record to disk. Press Y to save and then return to the main menu. N will return operation to the main menu without saving the current record to disk. Pressing R on any page will initiate this same action. Press K to save the current record to disk from any page and then return to the main menu. Any time a record is saved, it is first alphabetized by subject and by author within each subject. The subject, tag, and author fields are stored in a sequential file along with an assigned number. This number is used for direct access filing of the remaining fields. Pressing L allows selection of one of two formats for printing records (bibliography only or the complete record). Pressing E in the ADD mode will return operation to the main menu without saving the current record to disk.

The above functions work somewhat differently in the SEARCH mode. Instead of returning to the main menu when completed a check is made for further records under the current field heading(s) being searched and any records found will be displayed. If no records remain under the selected field heading(s) you will then be returned to the main menu. If you press E while in the SEARCH mode the record being displayed will be erased from your disk file.

SEARCH allows accessing records already contained within a file. These records may be displayed on the screen as in the ADD mode or sent to a printer. The records may be accessed individually or by various groupings. The following menu appears in SEARCH mode:

- 1) Subject-Tag-Author
- 2) Title
- 3) Return to Main Menu

If 1 is selected, eight ways of searching are possible. You will be prompted to enter a specific subject, tag, and author one at a time. The word "ALL" may be entered if all records under particular fields are desired. The following combinations are possible:

Subject	Tag	Author
ALL	ALL	ALL
(entry)	ALL	ALL
ALL	(entry)	ALL
ALL	ALL	(entry)
(entry)	(entry)	ALL
(entry)	ALL	(entry)
ALL	(entry)	(entry)
(entry)	(entry)	(entry)

If no records are found under specific entries you will be returned to the main menu.

If you have selected the screen for displaying of records and more than one record is contained under a specific entry you will be able to page through these records one at a time. Once a complete record is paged through and left for another, you can page back to it by pressing B.

If sent to a printer all records under specific fields selected will be printed within one of the two possible formats (bibliography or complete). If more than one record is filed under specific fields, they will be printed continuously until no more are found. When printing more than one record, lines are counted and paper is automatically advanced so that records do not cross over perforations. It is a good idea to set the paper so that printing begins at the top of a sheet. If records are chosen one at a time for printing this automatic advance will not occur.

P.O. BOX 1573 SALT LAKE CITY, UTAH 84110



Arcade games putting your kids in a tailspin? HARMONYCS educational software ends the arcade game dizzys.

************* EDUCATIONAL ************

MATCH & SPELL turns spelling drudgery into spelling fun. 16K Extended Basic \$11.95

MATHWAR is a 1st and 2nd grade math drill game.

16K Extended Basic

FLASHCARDS assists in studying anything from Mythology 16K Extended Basic . . \$11.95 to Medicine.

TIC-TAC-TOE MATH. Plenty of color and sound. Different age players can compete against each other with their 16K Extended Basic . . \$11.95 own skill level.

PRE-SCHOOL PAK. Alphabet recognition and counting drills. Hi-res graphics and sound.

16K Extended Basic . . . \$8.95

### *************** HOME & PERSONAL ***********

DISK MONEY MINDER. A home budget tool. Allows printout of category balances. Up to 56 user defined categories. Helps you watch those dollars and cents:

32K and Disk Basic . . . \$19.95

MONEY MINDER II. Cassette tape version of our popular DISK MONEY MINDER.

16K Color Basic . . . . . \$14.95

PIE-CHART. Let's you SEE your "slice of the pie." Charts nearly any data set you can imagine

16K Extended Basic . . \$10.95

AMORTIZATION. This is the most complete, most versatile amortization program available for the CoCo.

16K Extended Basic \$11.95

COLORHYTHM. Feeling down? Check your biorhythms with this excellent hi-res program.

16K Extended Basic . . . \$9.95

Gift certificates available. We pay shipping on all orders.

We ship next day...period! Write for free catalog.







You may select specific titles to search for, or "ALL" titles. When selecting a specific title you need type in only the first 32 characters. If a title is less than 32 characters you will need to press the space bar enough times to use up a total of 32 characters for a proper search.

When in SEARCH mode and displaying records to the screen, if you have made no changes to records being displayed you need not resave them to disk. If editing has taken place and you want changes set on disk, press K to save, or Y when asked.

Selecting LIST from the main menu will display the following menu:

- 1) Subjects
- 2) Tags
- 3) Authors
- 4) Subjects-Tags-Authors
- 5) Titles
- 6) Return

Press 1 to list all subject headings in alphabetical order and also the number of records contained under each. This list may be sent to either screen or printer. Selecting 2 or 3 will list tags or authors by subject. A specific subject may be selected or "ALL" may be selected. Again either screen or printer may be used. Modes 4 and 5 will be sent to the printer only. Pressing 4 will list to a printer all subjects, tags, and authors in alphabetical order by subject and by author within each subject. Titles may be listed by specific subject heading or all of them may be listed by typing "ALL" for the subject entry. Titles will be listed in the same sequential order as in the other listing modes.

Editing is accomplished through either ADD or SEARCH modes. It works in the same manner as entering information. Once you have selected a field to edit and the cursor appears on the screen in that particular field you are committed. If you have made a mistake and selected an incorrect field you will need to retype that field. Just pressing ENTER without retyping will erase any previous entry from RAM. Correcting a character error in any one field necessitates retyping that particular field and then resaving the record to disk.

When completing a session I suggest you END by going to the main menu and pressing 4. This will insure that all files are properly closed. You will find that BREAK is disabled in certain parts of the program to encourage use of the END routine.

(Larry Konecky holds a master's degree in guitar performance and is working on a Doctor of Music Education degree. He is currently Director of CAI in Music at Alcorn State University.)

W	2600236	31651A97
Ì	330041A	3355 1D4C
1	62506F8	40201FD2
l	101009D0	4110 <u>22</u> B9
1	14050C29	512025E8
l l	15900F4E	530528C7
	1830 11DE	5410 2B3A
1	2081 1532	5690 2DFC
- 1	2225 1803	END 3039

The listing:

1 IF PEEK(&H7EB9) <> &H32 THEN C LEAR 200, &H7EB0:FORI=&H82B9 TO & H831E:POKEI-&H4ØØ,PEEK(I):NEXT E

2 FORI=ØTO2:POKE&H7EBD+I,18:NEXT

: I=&H7F1E

3 POKEI,&H26:POKEI+1,3:POKEI+2,& H7E:POKEI+3,&H83:POKEI+4,&H22:PO KEI+5,&H7E

4 POKEI+6, &HA4: POKEI+7, &H4C

5 POKE&H19B, &H7E: RUN6

6 PCLEAR1:CLEAR8000:FILES6,1000 10 DIM S\$(140),T\$(140),A\$(140),R (140)

200 R\$#CHR\$(255):BC\$#STRING\$(32,

159):SX\$=STRING\$(8Ø,"-")

21Ø SC\$=STRING\$(64,191):SG\$=STRING\$(32,"-")

220 '*

221 '* OPEN BUFFERS

222 '*

235 OPEN"D", #1, "TITLE/DAT", 160

24Ø FIELD#1,8ØAST1\$,8ØAST2\$

245 OPEN"D",#2,"PUB/DAT",87

250 FIELD#2,30ASP\$,30ASV\$,15ASG\$,12ASD\$

255 OPEN"D",#3,"INFO1/DAT",225

260 FIELD#3,75ASI1\$,75ASI2\$,75AS

104

265 OPEN"D", #4, "INFO2/DAT", 225

270 FIELD#4,75ASI4\$,75ASI5\$,75AS

271 OPEN"D", #5, "INFO3/DAT", 225

272 FIELD#5,75ASI7\$,75ASI8\$,75AS

275 LSETT1\$="":LSETT2\$=""

28Ø LSETP\$="":LSETV\$="":LSETG\$="
":LSETD\$=""

285 LSETI1\$="":LSETI2\$="":LSETI3 \$="":LSETI4\$="":LSETI5\$="":LSETI 6\$=""

286 LSET17\$="":LSET18\$="":LSET19 \$=""

300 CLS3

305 PRINT@6," *BIBLIOGRAPHY FILE * ";

310 PRINT@66," SELECT FROM THE F OLLOWING ";

315 PRINT@162," 1) CONTINUE EXIS

320 PRINT@194," 2) BEGIN NEW FIL E (DISK) ":

325 Is=INKEYs:IFIs=""THEN325

326 IFI\$="1"THEN4ØØ

327 IFI\$="2"THENMS=1:GOTO6Ø5

33Ø GOTO31Ø

400 OPEN"I",#6,"SUBAUTH":X=1

4Ø5 INPUT #6,5\$(X)

406 INPUT #6, T\$(X)

407 INPUT #6,A\$(X)

408 INPUT #6,R(X)

409 IF EOF(6)=-1THEN415

410 X=X+1:GOTO405

415 CLOSE#6

500 D=0:C=0:CLS3:PRINT@6," *BIBL



JFD - COCO DISC SYSTEM - \$449

J & M Systems, Ltd. is a leader in the Model III marketplace with our JFD-III Disc Controller. With thousands in operation, we have set new standards in controller performance and reliability. We bring these same high standards to the COCO, resulting in the highest quality disc controller system on the market. Compare these functions before you buy:

- Price. \$449 includes controller, first drive, disc basic in ROM, and manuals. Just plug it in.
- Never needs adjusting. Our exclusive Digital Phase Lock Loop Data Separator and Digital Precomp Circuit eliminates the 3 adjustments found on other controllers.
- High quality standard production disc drives. For improved service and reliability. Tandon & Teac drives provide twice the read sensitivity that the drives found in other disc systems do, and hold their alignment far longer.
- Gold-plated card edge connectors throughout.
- Software compatible with Radio Shack Disc Basic, Flex, and OS/9.

J & M Systems, Ltd., 137 Utah NE, Albuquerque, N.M. 87108 (505) 265-1501 /



IOGRAPHY FILE* ";
501 LSETT1\$="":LSETT2\$=""
502 LSETP\$="":LSETV\$="":LSETG\$="
":LSETD\$=""
503 LSETI1\$="":LSETI2\$="":LSETI3
\$="":LSETI4\$="":LSETI5\$="":LSETI
6\$=""
504 LSETI7\$="":LSETI8\$="":LSETI9
\$="":S\$="":T\$="":A\$=""
505 PRINT@66," SELECT FROM THE F
OLLOWING ";:L=Ø
510 PRINT@168," 1) ADD ";
515 PRINT@200," 2) SEARCH ";
520 PRINT@232, " 3) LIST ";
521 PRINT@264," 4) END ";
522 I\$=INKEY\$:IFI\$=""THEN522
525 IFI\$="1"THEN MS=1:GOTO600
526 IF1\$="2"THEN MS=2:GOT03000
527 IF1\$="3"THEN MS=3:60T05000
528 IFI\$="4"THEN MS=4:GOTO2400
529 GOT05Ø5
600 IFS\$(X)="ZZZ"THEN700
605 X=X+1:W=X:IFX=1THENR(1)=1
61Ø IFX<141THEN7ØØ
615 PRINT@352, SC\$; : PRINT@384, SC\$
1:
620 PRINT@393," FILE FULL ";:X=X
-1
625 GOTO522

#### CASSETTE CONTROLLER Allows you to hear your cassettes without

unplugging cables. Switch knob between 

# SERIAL SWITCHER

### Switch your serial port between two or three

	IOIALLY SOLDERLESS KIIS	
4K	16K	00
	32K	
	32K	
	mary ungrades come complete with AEV or 20V butte	

easy-to-follow instructions, and 90-day unconditional warranty. PILOT LIGHT- includes 5 different colored lenses, and simple instructions. Mounts in 5 minutes to top cover of your

computer. With Lifetime	Warranty, only\$700
I.C.s	CABLES
6809E CPU \$25°0 6883 SAM \$25°0 6847 VDG \$20°0 6821 PIA \$8°0 Full Set \$65°0	Direct Coax to TV-3′, 6′, 9′, 12′. *10°°  * Serial M to M
★ FREE ★	*Joystick Ext. M to F

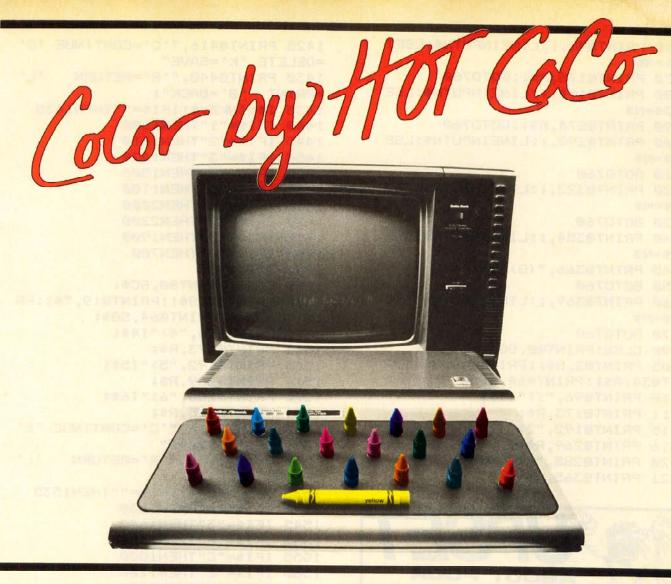
CATALOGUE Extra length, add 50° per ft.

Terms: Cashiers checks and money orders for immediate delivery • Personal checks allow 2 weeks • Orders under \$25 add \$2 shipping • C.O.D. add \$2 • California residents add 6%



```
697 **
698 '* PAGES
699 **
700 CLS2:PRINT@0,BC$;:PRINT@8,"
*BIBLIOGRAPHY* ";:FORBG=32T038ØS
TEP32:PRINT@BG, STRING$ (32, 143);:
705 PRINT@32, "S) "S$;
71Ø PRINT@49, "(T) "T$;
715 PRINT@64, "A) "A$;
72Ø PRINT@96, "1) "T1$;
721 PRINT@178, R$;
725 PRINT@192, "2) "T2$;
726 PRINT@274,R$;
73Ø PRINT@288, "P) "P$;
735 PRINT@320, "V) "V$;
740 PRINT@352, "D) "D$;
745 PRINT@366, "(G) "G$;
750 PRINT@416, "'C'=CONTINUE 'E'=
DELETE 'K'=SAVE"
755 PRINT@448,"'R'=RETURN
                              ? L ? ==
PRINT
       'B'=BACK";
76Ø Is=INKEYs:IFIs=""THEN76@
765 IFI$="S"THEN1200
770 IFI$="T"THEN1220
775 IFI$="A"THEN124Ø
78Ø IFI$="1"THEN126Ø
785 IFI$="2"THEN1280
790 IFI$="P"THEN1300
795 IFI$="V"THEN1320
800 IFI $= "G"THEN 1360
8Ø5 IFI$="D"THEN134Ø
810 IFI$="C"THEN1400
815 IFI$="E"THEN11@@
820 IFI = "K"THEN 2000
825 IFI$="R"THEN2200
830 IFIs="L"THEN1900
831 IFI$="B"THEN1000
835 GOTO76Ø
1000 IFMS=1THEN760
1005 IFMS=2 AND Y=1THEN760ELSEY=
Y-2:GOT0335Ø
1010 GOTO760
1100 PRINT@416, SC$; : PRINT@418, "
DELETE! ARE YOU SURE?
1105 PRINT@450," ( Y OR N ) ";
1110 Q$=INKEY$: IFQ$=""THEN1110
1115 IFQ$="N"THEN7@@
1120 IFQ$="Y"THEN2200ELSE1100
1200 PRINT@34,;:LINEINPUTN$:S$=L
EFT$(N$, 15):C=1
1205 IFT = ""THENPRINT@49, "(T)"; E
LSEPRINT@49, "(T)"+T$;
1210 GOTO760
1220 PRINT@52,;:LINEINPUTN$:T$=L
EFT$ (N$, 12)
1230 GOTO760
1240 PRINT@66,;:LINEINPUTN$:A$=L
EFT$(N$,30):C=1
```

1250 GOTO760



# If you like color...you're going to *love* HOT CoCo magazine.

The exciting new monthly devoted exclusively to the TRS-80 Color Computer.* It's from the publisher of 80 Micro.

Let HOT CoCo color your system with:

- · Feature articles on color graphic techniques
- Computer art
- Games
- Specific color applications in home, education, business and hobbies

PLUS

- ·Ideas on patching, aiding and trouble shooting
- ·Buyer's guides
- Product and book reviews
- Hardware interfacing and enhancing
- Programming techniques and tutorials

Best of all, HOT CoCo is written by users just like you.

The material is always up-to-date and useful. Hardware, software, books...what's new...what's best...what works. And you get one year for only \$24.97. A 13th issue is yours FREE with pre-payment (check or credit card). Use the attached order form, the coupon, or call toll free 1-800-258-5473. Subscribe Today!

PES! please sign me up for one year of HOT CoCo at \$24.97.** I understand that with payment enclosed or credit card order I will receive a free issue making a total of 13 issues for \$24.97.

	□CHECK/MO □BILL ME Exp. Date
	Interbank #
Address	
City	StateZip
Canada & Mexico \$27.97/1 yr. only, US Foreign surface \$44.97/1 yr. only, US Fu Please allow 6-8 weeks for delivery.	Funds mds drawn on US bank. 739FRB

HOT CoCo•PO Box 975•Farmingdale NY 11737

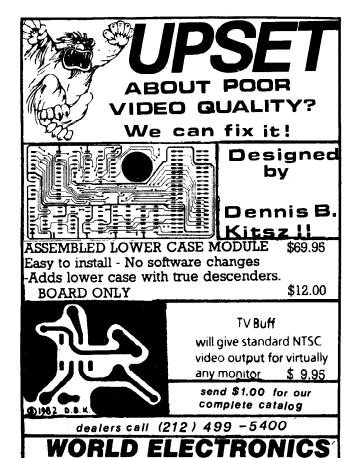
*TRS-80 Color Computer is a trademark of Radio Shack, a division of Tandy Corp.

*This price voids all previous offers.

HOT CoCo

1260 PRINT@98,;:LINEINPUTN\$:LSET T1 \$=N\$ 127Ø PRINT@178,R\$;:GOTO76Ø 1280 PRINT@194,;:LINEINPUTN\$:LSE 1290 PRINT@274,R\$;:GOTO760 1300 PRINT@290,;:LINEINPUTN\$:LSE 1310 GOTO760 1320 PRINT@322,;:LINEINPUTN\$:LSE **TV\$=N\$** 1330 GOTO760 134Ø PRINT@354,;:LINEINPUTN\$:LSE TD\$=N\$ 1345 PRINT@366,"(G)"G\$; 1350 GOTO760 136Ø PRINT@369,;:LINEINPUTN\$:LSE TG\$=N\$ 137Ø GOTO76Ø 1400 CLS6:PRINT@0,SC\$; 1405 PRINT@2,S\$;:PRINT@19,T\$;:PR INT@34, A\$;: PRINT@64, SG\$; 1410 PRINT@96, "1) "I1\$; 1411 PRINT@173,R\$; 1415 PRINT@192,"2)"I2\$; 1416 PRINT@269,R\$; 142Ø PRINT@288, "3) "I3\$;

1421 PRINT@365,R\$;



1425 PRINT@416, "'C'=CONTINUE 'E' =DELETE 'K'=SAVE" 1430 PRINT@448, "'R'=RETURN =PRINT 'B'=BACK"; 1435 I #= INKEY#: IF I #= ""THEN 1435 144Ø IFI\$="1"THEN16ØØ 1445 IFI\$="2"THEN161Ø 1450 IFI\$="3"THEN1620 1455 IFI\$="C"THEN1500 1460 IFI\$="E"THEN1100 1465 IFI\$="K"THEN2000 147Ø IFI\$="R"THEN22ØØ 1475 IFI\$="L"THEN19ØØ 1485 IFI\$="B"THEN7ØØ 149Ø GOTO1435 1500 CLS6:PRINT@0,SC\$; 1505 PRINT@2,9\$;:PRINT@19,T\$;:PR INT@34, A\$;:PRINT@64, SG\$; 1510 PRINT@96, "4) "I4\$; 1511 PRINT@173,R\$; 1515 PRINT@192, "5) "15\$; 1516 PRINT@269,R\$; 152Ø PRINT@288, "6) "I6\$; 1521 PRINT@365,R\$; 1525 PRINT@416, "'C'=CONTINUE 'E' =DELETE 'K'=SAVE" 1530 PRINT@448,"'R'=RETURN =PRINT 'B'=BACK"; 1535 I\$=INKEY\$:IFI\$=""THEN1535 154Ø IFI\$="4"THEN163Ø 1545 IFI\$="5"THEN164Ø 1550 IFI\$="6"THEN1650 1555 IFI\$="C"THEN1800 1560 IFI = "E"THEN 1100 1565 IFI\$="K"THEN2000 1570 IFI\$="R"THEN2200 158Ø IFI\$="L"THEN19ØØ 1585 IFI\$="B"THEN1400 159Ø GOTO1535 1600 PRINT@98,;:LINEINPUTN\$:LSET I1\$=N\$ 1605 PRINT@173,R\$;:GOTO1435 1610 PRINT@194,;:LINEINPUTN\$:LSE TI2\$=N\$ 1615 PRINT@269,R\$;:GOTO1435 1620 PRINT@290,;:LINEINPUTN\$:LSE TI3\$=N\$ 1625 PRINT@365,R\$;:GOTO1435 1630 PRINT@98,;:LINEINPUTN#:LSET 1635 PRINT@173,R\$;:GOTO1535 1640 PRINT@194,;:LINEINPUTN\$:LSE 1645 PRINT@269,R\$;:GOTO1535 1650 PRINT@290,;:LINEINPUTN#:LSE TI6\$=N\$ 1655 PRINT@365,R\$;:GOTO1535 1660 PRINT@98,;:LINEINPUTN\$:LSET 17\$=N\$

1665 PRINT@173,R\$;:GOTO1835

Brooklyn, N.Y. 11232

177 27th Street

### Superior Graphic Software Products

HOME OF MOTION PICTURE PROGRAMMING

### TRS-80® COLOR COMPUTER®



### TALKING GRAPHIC DEMONSTRATION

When someone sees your CoCo and asks "Just what does this thing do?" then load TALKING GRAPHIC DEMO and let your computer do its own show and tell, complete with musical background and a running commentary. As quoted in THE RAINBOW, "This is, frankly, better than anything the people who sell the machines have."

### THE DISK DOCTOR

### MPP-TUTORIAL

MPP-TUTORIAL....The programming tool of the professionals. You may not be a great artist, but you too can produce stunning, high resolution graphics. Detailed step by step instructions to create near studio quality animation. Quote CHROMASETTE, "..if you want to see and use the full graphic potential for your CoCo, this program is required!"

### THE TALKING SPELLER

### DIRECTORY DOCTOR

### **DATA DOCTOR**

### DISK HOSPITAL

### **EL CASINO**

EL CASINO....Three startling, action—packed high resolution graphic games, ideal for den and rumpus room parties. Games are programed with MPP graphics, and each is over 14K long. DICE GAME...This is the only craps game on the market that allows 4 players to make any or all to 12 field bets before every roll. BLACK JACK...The famous card counter not only shows the cards remaining in the deck, but computes the odds on hitting your hand with the cards remaining. SLOT MACHINE...Looks and sounds like a Casino machine. The arm drops, the windows roll, and the pay off (if any) hits the tray with a nice "clunk". Extended color basic. \$34.95



POSTAGE PAID

P.O. BOX 451 CANTON, NC 28716. For Fast Service Call 704/648-6015



1670 PRINT@194,;:LINEINPUTN\$:LSE TI8\$=N\$ 1675 PRINT@269, R\$;: GOTO1835 1680 PRINT@290,;:LINEINPUTN\$:LSE TI9\$=N\$ 1685 PRINT@365,R\$;:GOTO1835 1800 CLS6:PRINT@0,SC\$; 1805 PRINT@2,S\$;:PRINT@19,T\$;:PR INT@34, A\$; : PRINT@64, SG\$; 181Ø PRINT@96, "7) "17\$; 1811 PRINT@173,R\$; 1815 PRINT@192, "8) "18\$; 1816 PRINT@269,R\$; 182Ø PRINT@288, "9) "19\$; 1821 PRINT@365,R\$; 1825 PRINT@416, "'C'=CONTINUE 'E' =DELETE 'K'=SAVE" 183Ø PRINT@448, "'R' = RETURN =PRINT 'B'=BACK"; 1835 I = INKEY : IFI = "THEN 1835 184Ø IFI\$="7"THEN166Ø 1845 IFI\$="8"THEN167Ø 1850 IFI\$="9"THEN1680 1855 IFI\$="C"THEN2200 1860 IFI\$="E"THEN1100 1865 IFI\$="K"THEN2ØØØ 187Ø IFI\$="R"THEN22ØØ 1875 IFI\$="L"THEN1900





WEST BAY
ROUTE I BOX 666
WHITE STONE VIRGINIA 22578

"INVENTORY ONE" - (BY ALAN ROUSE) EFFICIENT, EASY TO
USE INVENTORY PROGRAM: SMALL BUSINESS. HOMES. CLUBS. USE INVENTORY PROGRAM: SMALL BUSINESS, HOMES, CLUBS. 🗵 1140 RECORDS 16K, 148 32K. PRINTS INVENTORY STATUS AND CENTRICATION REORDER REPORTS. BE RIGHT! 16-32K EXT TAPE \$20.00 "GRAPH ONE" - COLOR SCREEN BARGRAPHS IN SECONDS. MAKE 16-32K EXT TAPE \$ 8.00 BUSINESS PLANS COME ALIVE. KWIK-GRAF" -PRINT BARGRAPHS, EPSON OR OKIDATA PRINTER, MINUTES. NO SCREEN PRINT PROGRAM NEEDED. PRODUCES RAINBOW PHOTOREADY GRAPHS, MODIFIABLE. 8-32K EXT TAPE \$12.50 "FILE DNE" - SMALL DATABASE PROGRAM FOR FILES, RECIPES, ADDRESSES. PRINTS MAIL LABELS. 16-32K EXT TAPE \$12.50 "FAMILY PACK ONE" - FUN, EDUCATION, NO GAMES. USEFUL AT HOME, BUSINESS. SHOW FRIENDS. 16-32K EXT TAPE \$12.50: "IDOTHINK" - DO COMPUTERS THINK? 3 PROGRAMS WILL MAKE YOU WONDER, PONDER, GUESS. 16-32K EXT TAPE \$12.50 SPANISH <u>ONE"</u> - WORDS, PHRASES, SPANISH OR ENGLISH, HASŠ MSOUNDING GUIDES FOR SPEAKING. 16-32K EXT TAPE \$ 8.00 CHAINBOW ANISH THO - MORE ADVANCED. 16-32K EXT TAPE \$ 8.00 "MONITOR ONE" - SMALL MONITOR. 16-32K EXT TAPE \$ 6.00 FOR EDUCATION, PRE-SCHOOL. 16-32K EXT TAPE, EACH \$ 6.00 "LETTERS ONE" - ALPHABET WITH COLORS AND SOUND CUES. "NUMBERS ONE" - NUMBER LEARNING (1-12).

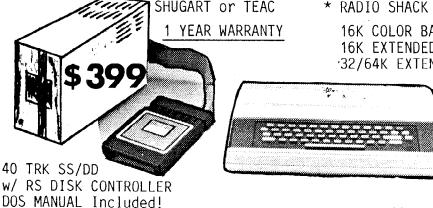
INCLUDES POSTAGE COSTS. IF VIRGINIA, ADD 4% SALES TAX. 

```
188Ø IFI$="B"THEN15ØØ
1885 GOTO1835
1900 PRINT@416, SC$; :PRINT@418,"(
B) IBLIOGRAPHY OR (C) OMPLETE";
1910 Is=INKEYS: IFIS=""THEN1910
1920 IFI = "B"THENP=1:GOTO4025
193Ø IFI$="C"THENP=2:GOTO4Ø25
194Ø GOTO191Ø
1990 '*
1991 '* ALPHABETIZE AND SAVE
1992 **
2000 PRINT@416, SC$;: IFMS=1THEN20
2005 IFMS=2 ANDC=1THEN2100
2010 IFMS=2AND C=0THENT$(Y)=T$:Z
=Y:GOT02Ø6Ø
2020 IFS$(X)="ZZZ"THENWW=R(X)ELS
EWW=X
2021 IFX=1THENZ=1:GOTO2045
2025 FORZ=X TO1STEP-1
2030 IFZ=1THEN2045
2035 IFS$<S$(Z-1)THENS$(Z)=S$(Z-
1):T$(Z)=T$(Z-1):A$(Z)=A$(Z-1):R
(Z) = R(Z-1): NEXTZ
2040 IFS$=S$(Z-1)ANDA$(A$(Z-1)TH
ENS*(Z)=S*(Z-1):T*(Z)=T*(Z-1):A*
(Z) = A + (Z-1) : R(Z) = R(Z-1) : NEXTZ
2045 S$(Z)=S$:T$(Z)=T$:A$(Z)=A$
2050 IFMS=1THENR(Z)=WW ELSER(Z)=
2060 PUT#1,R(Z)
2065 PUT#2,R(Z)
2070 PUT#3,R(Z)
2075 PUT#4,R(Z)
2076 PUT#5.R(Z)
2080 OPEN"O",#6,"SUBAUTH"
 2081 FORZ=1TOX
 2082 WRITE#6,5$(Z)
 2083 WRITE#6, T$(Z)
 2084 WRITE#6, A$(Z)
 2085 WRITE#6,R(Z)
 2Ø86 NEXTZ
 2Ø87 CLOSE #6
 2089 IFD=1THEND=0:Y=Y-1
 2090 IFMS=2 AND I$="R"THEN500
 2092 IFMS=2THEN3350ELSE500
 21ØØ W=R(Y)
 2105 FORV=Y TO(X-1)
 211Ø S$(V)=S$(V+1):T$(V)=T$(V+1)
 #A$(V)=A$(V+1)#R(V)=R(V+1)
 212Ø NEXTV
 2121 IFI = "K"THEN 2020
 2122 IF(I$="C" OR I$="R")AND Q$=
 "Y"THEN2Ø2Ø
 2124 S$(V)="ZZZ":T$(V)="":A$(V)=
 "ZZZ":R(V)=\
 2126 LSETP$="":LSETV$="":LSETG$=
 "":LSETD$="":LSETT1$="":LSETT2$=
```

2127 LSETI1\$="":LSETI2\$="":LSETI

3\$="":LSET14\$="":LSET15\$="":LSET I6\$="":LSETI7\$="":LSETI8\$="":LSE T195="" 2129 IFD=1THEN2Ø8Ø 213Ø GOTO2Ø2Ø 2200 IFMS=2 AND I\$="E"THEND=1:GO T021ØØ 2205 IFMS=1 AND I\$="E"THEN X=X-1 : GOT05ØØ 221Ø PRINT@416, SC\$;:PRINT@418, " DO YOU WISH TO SAVE THIS ";:PRI NT@45Ø," RECORD? (Y OR N) 2215 Q\$=INKEY\$: IFQ\$=""THEN2215 222Ø IFQ\$="N" AND MS=2 AND I\$="C "THEN 335Ø 2221 IFQ\$="N" AND MS=2 AND I\$="R " THEN5ØØ 2225 IFQ\$="N" AND MS=1 THENX=X-1 : GOT05ØØ 2230 IFQ\$="Y" AND MS=1 THEN2000 2235 IFQ\$="Y" AND MS=2THEN 2100 2250 GOT02215 2400 CLOSE 241Ø END 3000 CLS4 3005 PRINT@5," *BIBLIOGRAPHY SEA RCH* "; 3010 PRINT@66," SELECT FROM THE

FOLLOWING ": 3Ø15 PRINT@163," 1) SUBJECT-TAG-AUTHOR 3020 PRINT@195," 2) TITLE " = 3025 PRINT@227," 3) RETURN TO MA IN MENU " = 3030 I\$=INKEY\$:IFI\$=""THEN3030 3031 IFI\$="1"THEN3100 3Ø32 IFI\$="2"THEN34ØØ 3033 IFI\$="3"THEN500 3Ø35 GOTO3Ø1Ø 3100 CLS4 3105 PRINT@5, "*BIBLIOGRAPHY SEAR CH* "; 311Ø PRINT@64,"*INPUT SUBJECT: " 3115 PRINT@96," ";:LINEINPUTSE\$ 3120 PRINT@160,"*INPUT TAG: "; 3125 PRINT@192," ";:LINEINPUTTE 313Ø PRINT@256,"*INPUT AUTHOR: " 3135 PRINT@288," ";:LINEINPUTAE 314Ø PRINT@356," (S)CREEN OR (P) RINT? "; 315Ø I\$=INKEY\$:IFI\$=""THEN315Ø



* RADIO SHACK COLOR COMPUTERS *

16K COLOR BASIC \$ 179 16K EXTENDED COLOR BASIC \$269 32/64K EXTENDED COLOR BASIC \$369

> MASTERCARD/VISA WELCOME FOREIGN ORDERS WELCOME!

NEW 5 DAY SHIPPING SCHEDULES (IF STOCKED)

- * RADIO SHACK/ TANDY * EPSON * OKIDATA *
- * TRANSTAR * MANNESMAN-TALLY * STARKITS *
- * TOM MIX * MARK DATA * BMC * AMDEK * NEC *
- * BOTEK * MSI * SHROUT SW * NELSON SW *
- * MORETON BAY * DERRINGER SW * DATASOFT *
- * CUSTOM SW ENGRG * SOUTHERN SW SYSTEMS*
- * TAXAN * PRICKLY PEAR * SPECTRAL * ANTECO *
- * COMPUTERWARE * EIGEN SYSTEMS * COLORSOFT *
- * BERTAMAX * COGNITEC * DRESSELHAUS *

EMERALD COMPUTER SERVICES 4401 219th SW MOUNTLAKE TERRACE, WASH. 98043

206-778-9826

** FACTORY AUTHORIZED PRINTER REPAIR- EPSON, OKIDATA, TRANSTAR

*** TEAC Thinline 40 TRK DRIVES
*** TANDON DS/DD 40 TRK DRIVES

***COMPOSITE VIDEO CIRCUIT
***MEMORY UPGRADES D-E-F BOARDS

ALSO PRESENTING:

# MORROW DESIGNS | MICRO DECISION

September 1983

3155 IFI = "S"THENA=2:GOTO3190 3160 IFI\$="P"THENA=1:GOTO3170 3165 GOTO315Ø 317Ø PRINT@353,"(B) IBLIOGRAPHY O R (C) OMPLETE?"; 3175 I #= INKEY#: IF I #= "THEN 3175 3177 IFI\$="B"THENP=1:GOTO3185 318Ø IFI\$="C"THENP=2ELSE3175 3185 PRINT@352,SC\$;:PRINT@358," *** PRINTING *** "; 319Ø IFSE\$="ALL" AND TE\$="ALL" A ND AE\$="ALL" THEN3200 3191 IFSE\$="ALL" AND TE\$="ALL" T HEN332Ø 3192 IFSE\$="ALL" AND AE\$="ALL" HEN33ØØ 3193 IFTES="ALL" AND AES="ALL" T **HEN328Ø** 3194 IFSE\$="ALL" THEN3260 3195 IFTE\$="ALL" THEN3240 3196 IFAE = "ALL" THEN 3220 3199 FORY=1TOX: IFSE\$=S\$(Y) AND T E\$=T\$(Y) AND AE\$=A\$(Y) THEN4000E LSE335Ø 3200 FORY=1TOX:GOTO4000 3220 FORY=1TOX: IFSE\$=S\$(Y)ANDTE\$ =T\$(Y)THEN4ØØØELSE335Ø 324Ø FORY=1TOX: IFSE\$=S\$(Y) AND A E\$=A\$ (Y) THEN4ØØØELSE335Ø 326Ø FORY=1TOX:IFTE\$=T\$(Y) AND A

### SOFTWARE-HARDWARE

FOR RADIO SHACK'S TRS-80 MODEL 1/3 TRS-80 COLOR COMPUTER

### ·SEND FOR FREE CATALOG·

UTILITY PROGRAMS ON CASSETTE

SU-1 CASSETTE COPY \$10º SU-2 CASSETTE DUMP \$ 10≌

SPECIFY COMPUTER



TURN YOUR COMPUTER INTO A 2-SLOT SYSTEM. SWITCH BETWEEN THE TWO WITH EASE.

### RECORDER STAND



MADE OF STURDY PLASTIC. HOLDS RECORDER AT A PERFECT ANGLE

RAM/ROM USER-PAK FOR TRS-80 COLOR \$30

### ·GAMES ALSO AVAILABLE·

B.ERICKSON SOFTWARE PO.BOX 11099 CHICAGO IL 60611

CALL (312)276-9712ØINFORMATION

E\$=A\$ (Y) THEN4000ELSE3350 3280 FORY=1TOX:IFSE\$=S\$(Y)THEN40 ØØELSE335Ø 3300 FORY=1TOX: IFTE\$=T\$(Y)THEN40 ØØELSE335Ø 332Ø FORY=1TOX: IFAE\$=A\$(Y)THEN4Ø ØØELSE335Ø 335Ø IFMS=2THENNEXTY 3355 GOTO500 3400 CLS4 3410 PRINT@1," *BIBLIOGRAPHY TIT LE SEARCH* "; 342Ø PRINT@64, "*INPUT TITLE: "; 343Ø PRINT@96, "(ONLY FIRST 32 CH ARACTERS) "; 344Ø PRINT@128,;:LINEINPUTTE\$ 345Ø PRINT@356." (S)CREEN OR (P) RINT? ": 3455 I \$= INKEY\$: IF I \$= ""THEN 3455 3460 IFI\$="S"THENA=2:GOTO3495 3465 IFI\$="P"THENA=1:GOT03475 347Ø GOTO3455 3475 PRINT@353,"(B) IBLIOGRAPHY O R (C)OMPLETE?"; 348Ø I\$=INKEY\$:IFI\$=""THEN348Ø 3481 PRINT@352,SC\$;:PRINT@358," PRINTING *** "; 3485 IFI\$="B"THENP=1:GOTO3495 349Ø IFI\$="C"THENP=2ELSE348Ø 3495 IFTE\$="ALL"THEN3200 3500 FORY=1TOX:GET#1,R(Y) 351Ø IFLEFT\$(TE\$,32)=LEFT\$(T1\$,3 2) THEN4ØØØELSE335Ø 3990 '* 3991 '* PRINT ROUTINE 3992 '* 4000 IFS\$(Y)="ZZZ"THEN500ELSEGET #1,R(Y) 4ØØ5 GET#2,R(Y) 4Ø1Ø GET#3,R(Y) 4Ø15 GET#4,R(Y) 4Ø16 GET#5,R(Y) 4Ø17 S\$=S\$(Y):T\$=T\$(Y):A\$=A\$(Y) 4Ø2Ø IFA=2THEN7ØØ 4021 IFP=1THENPRINT#-2, TAB(20)S\$

(Y); TAB(45)T\$(Y)

4Ø25 PRINT#-2, A\$(Y)

4Ø3Ø PRINT#-2,T1\$

4Ø35 IFLEFT\$(T2\$,5)=" "THENP

RINT#-2, T2\$ELSEPRINT#-2, T2\$

4Ø4Ø PRINT#-2.TAB(3)P\$;TAB(4Ø)V\$

4Ø45 PRINT#-2, TAB(3)D\$; TAB(4Ø)G\$

4Ø46 IFP=1THEN4Ø85

4050 PRINT#-2, TAB(10)STRING\$(55,

4Ø65 PRINT#-2, TAB(15)S\$(Y);:PRIN T#-2, TAB(5Ø) T\$(Y)

4Ø75 IFLEFT\$(I1\$,5)="

4Ø7Ø PRINT#-2, TAB(1Ø)STRING\$(55, "-")

"THENP

### COLOR COMPUTER | FLEX* | OS-9† USERS

DO YOU WANT faster running programs (over 100 times faster than BASIC)? A high level language that is also a low level language? A compiler that runs in less than 32K? Assembly language output? Position independent code? Extensive library functions in source assembly code? Periodic newsletters with new library functions? An aid in learning assembly language? Liberal version updates?

C is the language of the eighties; accepted by IBM and Bell Labs for system development: a compact, highly versatile, easy to use language, excellent to use to build games, applications, utilities, operating systems, etc.

DUGGER'S GROWING SYSTEMS with over 21 years of experience in computing was first on the market with a 6809 C compiler. The compiler has been extensively tested, revised, and proven.

DUGGER'S GROWING SYSTEMS C is a growing subset of the standard C. Version 1 contains all the necessary C commands (while, if, if else, int, char, etc.). Version 2 contains additional features (float, long, for, goto, etc.).

AN EXTENSIVE
LIBRARY in assembly
language source is
provided (char, I/O,
formatted print,
filehandling, string
manipulating, etc.) Color
Computer version also has
additional functions which
use the BASIC ROM

functions (cls, poleat, floating point, etc.).

## ORDER NOW (new low prices)

Color Computer C Compiler Version 1.2 (disk version) \$49.95 Flex C Compiler Version 2.3 . . . . . . . . . . 120.00 OS-9 C Compiler Version 1.2 ........................95.00 C Programming Language by Kernighan & Ritchie (a must)....... . . . . 19.95 Computerware disk assembler ..... 49.95 Computerware Scribe (Disk editor-text formatter) . 49.95 Shipping add \$3.00 C.O.D. and Foreign handling add 15%

MasterCard and Visa accepted.

### PUGGER'S GROWING 画 SYSTEMS

Post Office Box 305 • Solana Beach California 92075 • (619) 755-4373

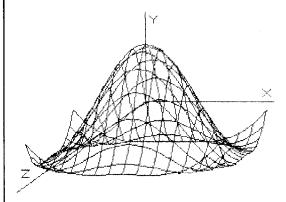
DEALER INQUIRIES INVITED

# Move up to Clanguage compiler

RINT#-2ELSEPRINT#-2, TAB(3) 11\$ 4076 IFLEFT\$(12\$,5)=" "THENP RINT#-2ELSEPRINT#-2.TAB(3)12# 4Ø77 IFLEFT\$(I3\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3) 13\$ 4Ø78 IFLEFT\$(I4\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3)14\$ 4Ø79 IFLEFT\$(I5\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3) I5\$ 4Ø8Ø IFLEFT\$(I6\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3) 16\$ 4Ø81 IFLEFT\$(I7\$,5)=" RINT#-2ELSEPRINT#-2, TAB(3) 17\$ 4Ø82 IFLEFT\$(18\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3) 18\$ 4Ø83 IFLEFT\$(19\$,5)=" "THENP RINT#-2ELSEPRINT#-2, TAB(3)19\$ 4Ø85 PRINT#-2,STRING\$(8Ø,"-"):IF P=2THENPRINT#-2 4Ø86 IFMS=1THEN7ØØ 4090 IFP=2 AND L=2THENGOSUB4150 4Ø95 IFP=1 AND L=8 THENGOSUB 415 4Ø96 L=L+1 4100 IFMS=2THENNEXTY ELSE700 411Ø GOTO5ØØ 415Ø IFP=2THENFORPR=1T09ELSEFORP R=1T03 416Ø PRINT#-2:NEXTPR

417Ø L=-1:RETURN 5000 PRINT@357," (S)CREEN OR (P) 5005 I = INKEY =: IFI = ""THEN 5005 5010 IFI\$="S"THENA=2:GOT05020 5015 IFI\$="P"THENA=1:GOT05020 5016 GOTO5005 5020 CLS7:PRINT@6," *BIBLIOGRAPH Y LIST* "; 5025 PRINT@66," SELECT FROM THE FOLLOWING "; 5Ø3Ø PRINT@132," 1) SUBJECTS 5Ø4Ø PRINT@164," 2) TAGS 5045 PRINT@196," 3) AUTHORS 5046 PRINT@228," 4) SUBJECT-TAG-AUTHOR "; 5050 PRINT@260," 5) TITLES 5052 PRINT@292," 6) RETURN 5055 I \$= INKEY \$: IF I \$= ""THEN 5055 5056 IFI = "1"THENLI = 1:GOTO 5067 5057 IFI = "2" THENLI = 2: GOTO 5067 5Ø58 IFI = "3" THENLI = 3: GOTO 5Ø67 5Ø59 IFI\$="4"THENLI=4:GOTO5Ø67

### YOUR COLOR COMPUTER JUST EARNED A MATH DEGREE!



### **MATHMENU**

Developed by an engineer, Mathmenu is a powerful menu-driven system to turn your Color Computer into an intelligent, flexible tool for mathematics and engineering. Mathmenu takes the tedium out of math, leaving your full brain power to attack the "meat" of your problems. By rapidly manipulating matrices and vectors, performing integration and differentiation, solving quadratic equations, plotting user defined functions and much more, Mathmenu can help simplify the most complex problems. Whether you are a student or a professional, if you use math, you need Mathmenu.

### **FEATURING:**

• 3D SURFACE PLOTTING — Plots a user defined equation on an X,Y,Z coordinate system in the High-Res graphics mode. Planes, surfaces of revolution, statistical surfaces, etc. can be easily plotted. Surfaces may be saved to disk or tape. We believe this is the only program of its kind commercially available for the Color Computer.

5060 IFI = "5" THENLI = 5: GOTO 5067

#### **PLUS:**

- Complete MATRIX Operations (up to 8 x 8)
- Complete VECTOR Operations
- Numerical Differentiation
- Numerical Integration
- Least Squares Curve Fitting
- Binomial Expansion
- Prime Number Verification
- 2D Function Plotting
- Rectangular to Polar Conversions
- Base Conversions
- Large Number Addition and Multiplication
- Reverse Polish Logic Calculator with Hexadecimal
- Quadratic Equation Roots • Main Menu with Single-key Selection and Return (Disk Only)

Complete documentation of all functions is included.

For 16K Cassette ...... \$49.95 Plotting Requires Extended BASIC Documentation only ..... \$5.00 (refundable with purchase)

Or write for free brochure.



113 Ward Street • Dept. R • New Haven, CT 06519 • (203) 562-5748

5061 IFI\$="6"THEN500 5067 IFA=2THEN5500 5070 ONLI GOTO5100,5200,5200,530 Ø,535Ø,5ØØ 5100 CLS5:PRINT@5," *PRINTING SU BJECTS* ": 5105 PRINT#-2, TAB(5) "*** BIBLIOG RAPHY SUBJECTS ***":PRINT#-2 511Ø CT=Ø:SS\$=S\$(1) 5115 FORV=1TOX:S\$=S\$(V) 512Ø IFS\$<>SS\$THEN5135 5125 CT=CT+1:NEXTV 5135 PRINT#-2, TAB(11) SS\$TAB(26)C T: IFS\$="ZZZ"THENPRINT#-2:GOTO500 514Ø SS\$=S\$:CT=1:NEXTV:PRINT#-2, TAB(11)SS\$TAB(26)CT:PRINT#-2:GOT 0500 5200 CLS5:PRINT@5," *BIBLIOGRAPH Y LIST* ": 5205 PRINT@64," INPUT SUBJECT AR EA :"; 521Ø PRINT@128,;:INPUTSU\$:CLS5:I FLI=2THENPRINT@8, " PRINTING TAGS ";ELSEPRINT@7," PRINTING AUTHOR S "; 5225 IFLI=2THENPRINT#-2,"*** BIB LIOGRAPHY TAGS ***"ELSEPRINT#-2, "*** BIBLIOGRAPHY AUTHORS ***" 5226 PRINT#-2 523Ø IFSU\$="ALL"THEN5235ELSE5275 5235 SS\$=S\$(1):PRINT#-2,TAB(5)S\$

(1) 5240 FORV=1TOX:S\$=S\$(V):IFS\$="ZZ Z"THENPRINT#-2:GOT05ØØ 5250 IFS\$<>SS\$THENPRINT#-2, TAB(5 ) S\$ : SS \$= S\$ 5255 IFLI=2THENPRINT#-2, TAB(9)T\$ (V) ELSEPRINT#-2, TAB (9) A\$ (V) 526Ø NEXTV:PRINT#-2:GOT0500 5275 PRINT#-2, TAB (5) SU\$ 528Ø FORV=1TOX:S\$=S\$(V) 5285 IFSU\$=S\$THENIFLI=2THENPRINT #-2, TAB(9) T\$(V) ELSEPRINT#-2, TAB( 9) A\$ (V) 529Ø NEXTV:PRINT#-2:GOT05ØØ 5300 CLS5:PRINT@8," PRINTING LIS T ";:PRINT#-2,TAB(25)"*** BIBLIO GRAPHY LIST *** ":PRINT#-2 5305 FORV=1TOX: IFS\$(V)="ZZZ"THEN PRINT#-2:GOT0500 5310 PRINT#-2, TAB(13)S\$(V)TAB(30 )T\$(V)TAB(45)A\$(V) 5315 NEXTV:PRINT#-2:GOT0500 5350 CLS4:PRINT@5," *BIBLIOGRAPH Y TITLES* "; 5355 PRINT@64," INPUT SUBJECT AR EA: "; 5360 PRINT@128,;:INPUTSU\$:CLS5:P RINT@7," PRINTING TITLES "; 5361 PRINT#-2,STRING\$(80,"*"):PR INT#-2, TAB(24) "*** BIBLIOGRAPHY TITLES ***":PRINT#-2,STRING\$(80,

### TRS-80* COLOR COMPUTER*

- -16K Extended Basic, Menu-Driven, Well-Documented, Easily-Modified.
- -For either cassette or diskette systems (Be sure to specify).
- -Place an order of at least \$40 and get one extra of your choice free.
- -Orders shipped on cassette Add \$5 for shipment on diskette.

#### -FURST-



Data Element Dictionary driven File Update and Retrieval SysTem. Create and maintain files according to your specifications. Ideas for applications included.....\$25

#### -MAILING LABELS-



Generate and maintain mailing label records. Selectively print desired quantities. Can keep several label files if desired. Designed for Printer VII, easily modified. \$20

### -REPORT WRITER-



#### -EXERCISE PLANNER-



Build and maintain complete exercise schedule for regular and/or weight programs. Display guides you through daily-calculated routines. Print complete schedule if desired .......\$15

#### -DISK DIRECTORY PRINT-



For diskette users only. Get hard copy of disk directories on your printer for easy use and reference. Only \$5

Send check or money order to:



#### **LAND SYSTEMS**

P.O. Box 232 Bellbrook, Ohio 45305



*TRS-80 and COLOR COMPUTER are Trademarks of Tandy Corp.

"*"):PRINT#-2 5365 IFSU\$<>"ALL"THEN5405 537Ø SS\$=S\$(1):PRINT#-2:PRINT#-2 ,TAB(15)"*****TAB(25)S\$(1)" *****":PRINT#-2.5X\$ 5375 FORV=1TOX:S\$=S\$(V):IFS\$="ZZ Z"THENPRINT#-2:GOTO5ØØ 538Ø IFS\$<>SS\$THENPRINT#-2:PRINT #-2, TAB(15)"*****TAB(25)5\$" *****":SS\$=S\$:PRINT#-2.SX\$ 5385 GET#1,R(V) 539Ø PRINT#-2,T1\$ 5395 IFLEFT\$(T2\$,5)=" "THENP RINT#-2 ELSEPRINT#-2,T2\$ 5400 NEXTV:PRINT#-2:GOT0500 54Ø5 PRINT#-2:PRINT#-2,TAB(15)"* ****"TAB(25)SU\$" *****":PRIN T#-2, SX\$ 5410 FORV=1TOX:5\$=5\$(V):IFS\$="ZZ Z"THENPRINT#-2:GOT0500 5415 IFSU\$<>S\$THEN5425 5420 GET#1,R(V):PRINT#-2,T1\$:IFL EFT\$(T2\$,5)=" "THENPRINT#-2 ELSEPRINT#-2, T2\$ 5425 NEXTV:PRINT#-2:GOTO500 5500 ONLI GOTO 5600,5700,5700,55 10,5510,500 5510 PRINT@354," ALVAILABLE ON P RINTER ONLY ";

### SP SOFTWARE



### FOUR NEW PROGRAMS FOR YOUR COLOR COMPUTER

SPDUMP A screen dump routine of 360 bytes of fast, relocatable machine language code. All PMODES, color PMODES in 4 B&W shades, twice size option in PMODES 3 or 4, position dump on paper, inverse image option, do more than 1 screen as for MPP graphics. Works on DMP200 LPVII etc. Comes with BASIC instructions. Needs BASIC1.1 or an 8bit printer fix. On tape. \$16

CONCPOLY Use this menu driven program to design and draw a fantastic variety of intricate and colorful patterns, suitable for dump to a printer. includes examples and instructions. Works in a 16K computer, EXT. or DISK BASIC. Comes on tape. \$8

SIXFOURK Use your 64K computer from BASIC. This program allows you to inspect RAM, move ROM to RAM and run it there, disable DISK or EXT. BASIC, and make setups with graphics, program, strings, and USR in upper or lower RAM to get the best use of RAM. The program does the setups and includes tutorials and instructions to let you make setups. On tape. \$28

ROTHORLD This showy program for the 64K computer will display a rotating color globe of the earth. You get 28 frames of a PMODE1 globe which is loaded into 60K of RAM by a driver program plus an instruction program all on disk to show off your 64K color computer. \$25

Free little graphics program with order or request for our catalog. For fast service send check or MO to:

SP SOFTWARE, 1102 BILTMORE, LYNCHBURG VA 24502

5520 PRINT@384, "DO YOU WANT TO P RINT? (Y DR N)" 553Ø I=INKEY=:IFI=""THEN553Ø 5540 IFI\$="Y" AND LI=4THEN5300 5550 IFI = "Y" AND LI=5THEN5350 5560 IFI = "N"THEN500ELSE5530 5600 CLS5:PRINT@3," *BIBLIOGRAPH Y SUBJECTS* "::CO=1 5610 CT=0:SS\$=S\$(1) 5615 FORV=1TOX:S\$=S\$(V) 562Ø IFS\$<>SS\$THEN5635 5625 CT=CT+1:NEXTV 563Ø PRINT@32*CO+34,CO;TAB(7)SS\$ TAB (25) CT; 5631 GOSUB5675:GOTO500 5635 PRINT@32*CO+34,CO; TAB(7)SS\$ TAB(25)CT;:CO=CO+1:IFS\$="ZZZ"THE N5631 564Ø SS\$=S\$:CT=1:IFCO=>1ØTHENGOS UB5675 5645 NEXTV:PRINT@32*CO+34,CO;TAB (7) SS\$TAB(25) CT; 5650 GOSUB5675:GOTO500 5675 PRINT@452," PRESS 'C' TO CO NTINUE ";:CO=1 568Ø I\$=INKEY\$:IFI\$=""THEN568Ø 5685 IFI = "C"THENCLS5: RETURN 569Ø GOTO568Ø 5700 CLS5:PRINT@5." *BIBLIOGRAPH Y LIST* "; 57Ø5 PRINT@64," INPUT SUBJECT AR EA: "; 571Ø PRINT@128,;:INPUTSU\$:CLS5:C 5715 IFLI=2THENPRINT@7," TAGS BY SUBJECT "; ELSEPRINT@5." AUTHORS BY SUBJECT "; 572Ø IFSU\$="ALL"THEN5725ELSE5775 5725 SS\$=S\$(1):PRINT@32*CO+32,S\$ (1);:CO=CO+1 5730 FORV=1TOX:S\$=S\$(V):IFS\$="ZZ Z"THEN582Ø 5735 IFS\$<>SS\$THENPRINT@32*CO+32 ,S\$"";:CD=CO+1:SS\$=S\$ 574Ø IFLI=2THENPRINT@32*CO+34,T\$ (V); ELSEPRINT@32*CO+34, A\$ (V) 5745 CO=CO+1: IFCO=>11THENGOSUB56 575Ø NEXTV:GOSUB5675:GOTO5ØØ 5775 PRINT@32*C0+32.SU\$; 578Ø FORV=1TOX:S\$=S\$(V) 5785 IFSU\$=S\$THEN58ØØ 5790 NEXTV:GOSUB5675:GOTO500 5800 IFLI=2THENPRINT@32*CO+66,T\$ (V); ELSEPRINT@32*CO+66, A\$ (V); 58Ø5 CO=CO+1:IFCO=>11THENGOSUB56 75 581Ø NEXTV

582Ø GOSUB5675:GOTO5ØØ

# Skyline Software

### **PUBLISHERS OF QUALITY MICROCOMPUTER SOFTWARE**

**PAGE PLUS** — Attention BASIC programmers! Here is the software you've been waiting for! Up to 56 K available from your BASIC programs. This utility, written by Chris Hawks, does the memory management necessary to utilize the two 32K banks of memory. Easy enough for any 'intermediate' level BASIC programmer to use. Includes documentation and demo programs to show you how to use PAGE PLUS to get the most out of your computer. Works with 64K tape or disk systems.

Cassette \$27.95 Disk \$29.95

MDISK — Hal Snyder's latest breakthrough for the 64K Color Computer! MDISK lets you use the upper 32K of memory for rapid storage and retrieval of programs and data. Whether you own an actual disk drive or not, MDISK puts the 'hidden' 32K to work for you as a 'virtual disk,' with capability to save and load up to 15 programs, view a directory of files stored in 'page 1', kill unwanted page 1 files, execute BASIC or machine language directly from MDISK, chain to a BASIC program while preserving data already created, and more. These functions are available not only under manual keyboard control, but from programs in progress as well, permitting high-speed swapping of programs or data. Unlike many 64K utilities, MDISK doesn't copy BASIC to RAM. This greatly increases the amount of workspace available to you (by 22K in a disk system). MDISK is written in position independent code, and will work on disk or tape based 64K systems. Full documentation included.

Cassette \$27.95 Disk \$29.95

**ROMBACK** — Why pay more? The easiest to use ROM-pak dumping utility available! At the best price, too! Comes with full documentation, including detailed patching instructions to allow several popular 'problem' cartridges to run from tape or disk. Stop plugging and unplugging your disk controller! Don't blow any more SAM chips or 6809Es! Use ROMBACK, and run those programs from tape or disk instead. Works with any 64K Extended BASIC tape or disk system.

Cassette \$16.95

**QUICKSORT** — A machine language sort routine specifically designed to be used by BASIC programmers. This utility will speed up those programs where a BASIC sort is just too slow. Great for mailing lists and databases. Can be incorporated into many existing programs as well. Written in position independent code, works on tape or disk systems. 16K required.

Cassette \$12.95

**64K BOOT/PAGER** — Two 'must have' utilities for the 64K Color Computer owner. The 64K Boot allows you to modify BASIC by moving it from ROM to RAM. The PAGER is a menudriven utility allowing you to manually page between the 32K banks of

driven utility allowing you to manually page between the 32K banks of memory, copying BASIC or data from one page to the other. The complete assembler source code for both programs is included, so you can see how it's done! Both programs are written in position independent code and run on 64K tape or disk systems.

Cassette \$19.95

**STRUCTURED MACROS** — An assembly language programming tool for users of the Macro-80C assembler, by the Micro Works. Structured macros come close to transforming your assembler into a high-level language. Your programs become more understandable and debugging is simplified. Commands include IF, ELS, ENDIF, IFTST, IFCC, WHILE, ENDWH, REPEAT, and UNTIL.

Disk \$19.95

**WIZARD'S TOMB** — A text and graphic adventure that the whole family can play! Like no other that you've played before. Up to four players can be involved in the attempt to enter the Wizard's Tomb. 16K and Extended BASIC required.

Cassette \$12.95

**WIZARD'S TOMB, PART II** — Takes up where Wizard's Tomb left off. Now that you've found the treasure in the Wizard's Tomb, try to find your way through the ten levels of the catacombs! Good luck—you'll need it! 32K and Extended BASIC required.

Cassette \$15.95

**WIZARD 64** — If you've got 64K, then this one's for you! Uses both 32K pages of memory for graphics and action — combines the features of Wizard's Tomb and Wizard's Tomb Part II into one great game. Challenging enough for adults, yet entertaining for younger players too. 64K Extended BASIC required.

Cassette \$21,95

Disk \$23.95

All Software Available on 3" AMDISK Cartridges — \$4 additional Dealer Inquiries Invited.

### ORDERING INFORMATION

ALL ITEMS SHIPPED FROM STOCK

Phone orders may be placed at:

(312) 260-0929 (Our voice line), or with your

computer at: (312) 588-7917 (Our MODEM line)

Mail orders should be sent to:

SKYLINE MARKETING 442 Sunnyside Wheaton, IL 60187







### Greetings!

It's all right to be drawing squares, triangles, decagons, and such, but what is life without circles? I thought about circles for some time, but for the life of me I couldn't figure out how to make the turtle move in a curved line. I have a little instruction booklet about Color Computer turtle graphics, so I looked for "curves" in the index, and didn't find a thing. Finally, I happened one day to be down by the pond, and what do you think I saw? I saw that old turtle that had snuck out of my house a month earlier, and he was swimming. When he left he had taken my pen with him, which I had tied to the middle of his back and let hang down behind him, so he could draw. But by now the pen had slipped around so it was caught on his hind leg. Poor turtle! Maybe Bertha was right to report me to the SPCA the way she did. In any event, that pen was causing the turtle to be off balance, so that instead of swimming in a straight line, he was swimming in circles.

I studied closely, and discovered that his circles weren't really perfect circles. Everytime he stroked with his left foot, the pen at the end acted sort of like an oar and made him turn very slightly to the right. But after that initial turn, he would go straight again. In other words, his "circle" was not really a big closed curve, but a closed, many, many sided figure—a "hundred-agon," or a "thousand-agon." I went back to my Color Computer, determined to try out this principle that so fortuitously appeared to me at the pond. (Anybody believe in fate or astrology?)

The first thing I thought was that in this new many-sided figure, I wanted to make each turning angle as small as possible. That meant each turn would be 1. I decided that each side should be as small as possible, too, so that my turtle might stay on the screen. I started with:

FD 1

RT 1

FD₁

RT 1

planning to make 360 FDs, and 360 RTs. Pretty soon, however, my fingers got tired. I thought to myself, "There must be an easier way. A computer is a labor-saving device, and I need my labor saved."

Well, there is an easier way, and I won't embarass myself by telling you how long it took me to discover it. There is a

# ALMOST UNBELIEVABLE!



wholesale distributors of tandytm computer systems



### ELECTRONICS SYSTEM 100 PERSONAL COMPUTER

64K EXTENDED COLOR

(Delivered Anywhere in the USA)

Everything You Need From Software To Hardware

### **DEALER INQUIRIES INVITED**

Call or Write for Details on Programs and Discount Pricing



16012 South Cottage Grove Ave, South Holland, IL 60473 Division of Union Electronics, Inc.

312-339-2777

whole 'nother section of the program where you can type in commands to the turtle and store them for later use. This next section is sometimes called "the edit mode." I call it "the edit room," because I like to think of the Color Computer turtle graphics program as a little house with rooms. Well, to get to the EDIT room from the RUN room, first press the BREAK button. That puts you back out on the house's front porch. Then press E for EDIT.

Now you're in the *EDIT* room and there's a little eyebrow at the bottom of the screen.

Before getting back to the circle, let's practice with something simpler. Let's start with a square. In the edit room, it's best to label what you are doing, because you will be storing that "procedure" in the computer's memory. So let's label our square procedure with something like this:

### TO SOUARE

Now, you'll have to play around with the keys a little before you become comfortable with typing in the *EDIT* room, but basically the up and down and right and left arrows will help you move around as you wish. Anyhow, here is how I type out a procedure for squaring:

TO SQUARE FD 40 RT 90

FD 40 RT 90

FD 40 RT 90

FD 40 RT 90

**END** 

There are some things you might wish to notice about the way I have typed in the procedure. First (or last), notice that I typed in *END* at the end. It's important to inform the turtle that a procedure has ended. Second, remember that the

procedure needs that label (TO SQUARE). Third, notice that I didn't use a separate line for each instruction. In the RUN room, I had to ENTER each instruction separately, automatically giving each instruction its own private line. Here, I can type several instructions per line, as long as I separate them by a space. It so happens I chose to type in only two instructions per line before starting a new line; and the only reason I did was that I realized my instructions for moving forward and turning were going to be repeated four times, and I just wanted to be able to see the repetition easily. So I started a new line each time I repeated the instructions to move and turn. It does make it easier to see, yes? If you wish to try this procedure out on your own, please feel free to experiment. For instance, you could type in the following:

TO SQUARE FD 40 RT 90 FD 40 RT 90 FD 40 RT 90 FD 40 RT 90

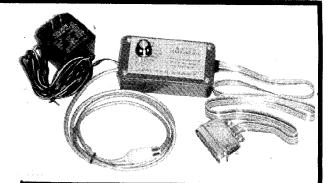
END

In any case, let's try to run this procedure. Press BREAK, then R, and you're in the RUN room. Then type in SQUARE. Does it work? If so, try it a second and a third time. What happens? That's neat! The turtle zooms around the square again and again. He's drawing over and over again on the same spot. We must be doing something right. However, let's try something else. You try what you want; but here is what I want. I go back into the EDIT room, and erase the last angle command. I don't really need that to draw the square; all it does is turn the turtle right back into his original direction. But what will happen if he's not returned back to the original direction? Here is what the squaring procedure looks like now:

# PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER
AND THE TOP 100

- * RUN ANY STANDARD PARALLEL PRINTER FROM THE SERIAL I/O PORT
- * WORKS WITH: EPSON, NEC, CENTRONICS, C-itoh, SMITH CORONA, RADIO SHACK, GEMINI, OR ANY STANDARD PARALLEL PRINTER
- * SWITCH SELECTABLE BAUD RATES FROM 300 to 9600
- COMPLETE ALL CABLES AND CONNECTORS INCLUDED
- * PRICE: \$69 plus \$3 for shipping and handling. Canadian orders add \$5 for shipping. Michigan residents add 4% sales tax.



### PRINTERS

C-itoh PROWRITER ----- \$ 365

GEMINI 10X----- \$ 299

EPSON FX80 ----- \$ 550 EPSON RX80 ----- \$ 370

Plus shipping

CALL FOR PRICES ON OTHER MODELS FROM THE ABOVE PRINTER MANUFACTURERS

### BOTEK INSTRUMENTS

313-739-2910

Dealer inquiries invited

4949 HAMPSHIRE UTICA, MICHIGAN

48087

TO SQUARE FD 40 RT 90 FD 40 RT 90 FD 40 RT 90 FD 40 END

I go back to the RUN room to try this out. Sure enough, it still works. I still get a square, only the turtle is not set back in his original direction. Now, if I run the squaring procedure several times, I get something more interesting than the turtle going around and around on his original path. Try it.

Here's an idea. I have run a procedure four times in the RUN room. How about if I turn that into a procedure? I go back to the EDIT room and define the following procedure (typing it out underneath—not over—the TO SQUARE procedure):

TO SQUAREAGAIN

SQUARE

SOUARE

**SQUARE** 

**SQUARE** 

**END** 

I zip back into the RUN room, and run SQUARE-AGAIN. It works! Now, you try something along that line and see what happens. David, why don't you try doing something similar with triangles? Jonathan, try pentangles.

Thinking about it, we've done some interesting things. First of all, by defining procedures in the *EDIT* room, we've actually added to the simple commands that the turtle understands in the *RUN* room. It used to be that the turtle only understood how to RT and LT and FD and BK and et cetera. Now it understands how to SQUARE and SQUAREAGAIN, and (if you've done it) TRIANGLE and TRIAGAIN and PENTANGLE and PENTAGAIN. Another interesting thing is that we've put procedures inside of

### C.C. DIALER



Let your Co. Co. do the "walking".

Turn your computer into an automatic telephone dialer.

Generate touch tones from C.C.'s keyboard or stored directory.

Save, load and modify directories on tape or disk.

Requires Extended Basic and Touch Tone phone service.

CASSETTE VERSION - \$29.95 DISK VERSION - \$34.95

Send cheque or money order to:

CHRIS COMPUTERS 6299 Alderwood Lane Delta, B.C. Canada V4E 3E7



IB.C. Residents include 6% Sales Tax)

procedures. TO SQUAREAGAIN, for instance, is a procedure that contains some TO SQUARE procedures.

Now, if I had my tape recorder hooked up to my Color Computer, I would be able to save these new procedures on tape. They'd be part of my turtle's new repertoire forever. Isn't that neat! The turtle becomes more and more clever. It's as if you're a horse trainer, or a dog disciplinarian. I've got to get my tape recorder in there. Those of you with disks will be able to save procedures on disks.

I haven't forgotten about circles, and I'll get around to them in about two shakes.

Looking back at all my procedures, they look pretty simple. TO SQUAREAGAIN was merely TO SQUARE repeated four times. TO SQUARE was merely FD 40 and RT 90 repeated four times. Is there a shorthand for repeating parts of a procedure? You bet there is! Try this:

TO SQUAREAGAIN2 REPEAT 4 (SQUARE)

**END** 

And this:

TO SQUARE2

REPEAT 4 (FD 60 RT 90)

END

If something goes wrong in your experimentation, just remember that the turtle carries out everything you tell it to with absolute precision and literalness. Your instructions have to be perfect. Now, if I can make the turtle automatically repeat instructions for a four-sided figure, surely it will do the same for the 360-sided figure that I want to use to approximate a circle. I try this:

TO CIRCLE REPEAT 360 (FD 1 RT 1) FND

Unfortunately, that silly little ninny on the screen draws a stop sign instead of a circle. I can take a hint. I'm going to stop right now. See you next month. Maybe by then you or I will have figured out why the turtle drew a stop sign. Write me a letter, and let me know. I know I've promised to tell you about the pig incident, and I will—but I just don't have time right now. I remain,

Uncle Bert

P.S. You can send your cards and letters to me in care of my good friend Dale Peterson. Just address them like this:

Uncle Bert Woofensburger c/o Dale Peterson the Rainbow 9529 U.S. Highway 42 P.O. Box 209 Prospect, KY 40059

### **RAINBOWfest**

Ft. Worth

October 14-16

# COLORSPEAK

COLOR COMPUTER VOICE SYNTHESIZER

### UNLIMITED SPEECH!

FEATURES

### SPEAKS FOR ITSELF!

- . A' COMPLETE PHONEME BASED VOICE SYNTHESIZER IN A CARTRIDGE STYLE PAK
- COLORSPEAK HAS ITS PROGRAM IN ROM, SO ITS INSTANTLY THERE ON TURN ON!
- USES THE VOTRAXIM SCOT PHONEME SYNTHESIZER CHIP
- TEXT TO SPEECH MODE: CONVERTS PLAIN ENGLISH TEXT TO SPEECH!
- INFLECTION MODE: ADDS VOICE INFLECTION TO TEXT TO SPEECH MODE
- PHONEME MODE: ALLOWS PROGRAMMING THE SCO1 DIRECTLY IN PHONEMES
- SPELLING MODE: SPELLS TEXT AND PRONOUNCES MOST PUNCTUATION

### "SUPER! EASY TO USE" D.C. MIAMI

USER FRIENDLY!COLORSPEAK IS THE EASY TO USE VOICE SYNTHESIZER WITH ALL FEATURES EASILY ACCESSIBLE FROM BASIC. SIMPLY PUT THE WORD OR PHRASE TO SPEAK IN A STRING NAMED TALKS. THEN CALL THE USR ROUTINE TO SPEAK THE TEXT! ALL OF BASICS STRING MANIPULATIONS ARE APPLICABLE. COLORSPEAK COMES WITH A DETAILED USER MANUAL, PHONEME DICTIONARY AND DEMO TAPE. PRICE \$ 169 USER MANUAL \$4

BUMBLEBEE SOFTWARE

PO BOX 25427 CHICAGO IL 80825 TEL 312-275-4183

10% OFF TO SIGHT IMPAIRED 90 DAY GUARANTEE

### ARCADE ACTION

HIRES COLOR MACHINE LANGUAGE PROGRAMS

### NOVA-PINBALL

FEATURES

Arcade Action Graphics and Sound 4 Players-Bonus Ball-Bonus Scores Live Action Flippers-Ball Kicker Action Bumpers and Thumpers \$20

### CYBORG WARS 🌣

Your mission is to destroy all robots and save the surviving humans. Watch for the missle firing BRAINS and the fatal touch of the HULKS!

### DERBY



Race around the track with a computer controlled car in pursuit. Like the arcade, DODGE-EM! \$14

### PAC MAC

**Great PAC-MAN action!** 

HOPPY



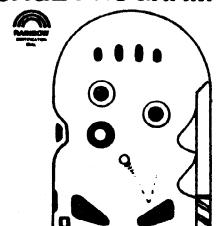
\$15

Guide HOPPY safely home to his dock, travel across a highway and hop on LOGS & TURTLES to get there! \$1

PINBALL!

DEALER, AUTHOR INQUIRIES INVITED

TEL 312-275-4183



## If You're Serious About Programming Then You Need

### **HUMBUG**

HUMBUG — The Ultimate Monitor that has long been the best in the 6800/6809 big system market is now available for the Color Computer. This is the monitor you need if you do any machine or assembly language programming. 37 commands allow you to enter, examine, start, stop, even single-step machine language programs. Use the computer as a terminal to another computer, or use an external terminal to control your Color Computer. HUMBUG allows you to do things you could never do before.

Stop playing with toys and join the professionals with HUMBUG. We have shipped HUMBUG to Rutgers University, University of Massachusetts, McGill University, General Electrodynamics Corp., Clarke Institute of Psychiatry, Bucks County Community College, MTC Microtech (Germany), Algoma Steel Corp. (Canada), McMaster University (Canada), Schlumberger Corp., American Phonemeter Corp., Atomic Energy of Canada, Jackson Laboratory, Collins Radio, U.S. Navy, California Corrections Department, Rhodes University (South Africa), Data General Corp., Texas Tech University, Forde Electronics (Ireland), University of Nevada, and more.

Once you use HUMBUG you'll never go back to anything else. Available on disk or cassette for \$39.95

Ask for catalog. NY State residents please add sales tax.

### Star-Kits

P.O. Box 209 – R Mt. Kisco, N.Y. 10549 (914) 241-0287

*********

### Color Computer Programs From Star-Kits

HUMBUG — The Ultimate Monitor that has long been the best in the 6800/6809 big system market is now available for the Color Computer. Has 37 commands to enter, examine, start, stop, even single-step machine language programs, and more. Disk or cassette \$39.95 on ROM pack \$69.95.

SPELL 'N FIX — The best 6800/6809 spelling correction program now for the Color Computer. Features a dictionary with more than 18,000 words, full prompting and really professional operation. Expand or customize your dictionary, even correct the errors. \$89.29.

CHECK 'N TAX — a set of programs to balance a checkbook and maintain income and expense data for income tax purposes. \$50. ROMOTERM allows you to control and run the Color Computer from a standard CRT terminal, so you can get a display of as much as 24 lines by 80 characters. (Terminal can even be connected via a modem!) \$19.95.

SHRINK - our version of the famous Eliza program. Extremely fast. \$15

All above programs require minimum of 16K, except CHECK 'N TAX requires 32K RAM. Extended Basic is not required. SPELL 'N FIX and CHECK 'N TAX require either Radio Shack disk system or Flex-compatible disk.

### **Star-Kits**

P.O. Box 209 - R Mt. Kisco, N.Y. 10549 (914) 241-0287



### H OW DO YOU SPELL RELIEF?

If proofreading your word processing text leaves you bleary-eyed, then rest your eyes with

### **SPELL 'N FIX**

**SPELL 'N FIX** proofreads your text for spelling and typographical mistakes in the twinkling of an eye. It looks up each word in the dictionary and reports every mistake. It finds errors that even experienced proofreaders miss. And when it finds them, it lets you fix them — fast. The result? Perfect text, every time. Without eye strain.

**SPELL 'N FIX** is compatible with all word processor programs. Available on disk or cassette for \$69.29, cheaper than a new pair of bifocals. Price includes 20,000 word dictionary; optional 75,000 word dictionary (strictly for the professional writer) is \$50 additional.

#### ALSO AVAILABLE

<b>HUMBUG</b> the ultimate debugger/monitor	\$39.95
<b>STAR-DOS</b> disk operating system	\$49.90
<b>CHECK 'N TAX</b> home finance package	\$50.00
<b>REMOTERM</b> for use with a remote terminal	\$19.95
<b>NEWTALK</b> voice debugging program	\$19.95
SHRINK our version of Eliza	\$15.00

Send for catalog. We accept checks, COD, Visa or MasterCard. NY State residents please add sales tax.

### STAR-KITS

P.O. BOX 209 — **R** MT. KISCO, N.Y. 10549 (914) 241-0287

# Color Computer Memory Map

By BOB RUSSELL

his is the third installment in a comprehensive series of references on the Color Computer memory, and covers BASIC and Extended BASIC ROM.

This memory map has been created after many hours of research, investigation and experimentation. I probably have over 650 hours already invested in this project and I know I am not finished. I fully intend to offer periodic updates to this document. My wish is that this will become a living, growing document that you will also contribute to. I hope you will bring any errors to my attention and also share any unmapped discoveries you may have made.

Among those publications offering the most accurate and reliable memory information are Radio Shack's Service Manual, Color Computer News and the Rainbow. If you refer to these resources you will often find detailed information (sometimes even a commented listing that can be matched to a disassembled listing to really describe what is going on!). Throughout the Map, I will refer to some of these resources.

An *S* indicates a ROM or RAM based routine that you could potentially call from your own assembly language program. \$nnn is a notation for hexadecimal values.

Sources referred to in this map:

1) Getting Started With Color BASIC Copyright 1981 Tandy Corp. Fort Worth, TX 76102

2) Going Ahead With Extended BASIC Copyright 1981 Tandy Corp. Forth Worth, TX 76102

3) Service Manual, TRS-80 Color Computer Catalog Number 26-3001/3002

4) TRS-80 Microcomputer News (for TRS-80 users) P.O. Box 2910

Forth Worth, TX 76113-2910 5) Color Computer News

REMarkable Software P.O. Box 1192

Muskegan, MI 49443

6) the Rainbow

9529 U.S. Highway 42

Prospect KV 400

Prospect, KY 40059

7) 80 Micro 80 Pine Street

Peterborough, NH 03458

If you don't want to cut up your Rainbow Magazine you may purchase copies of the Memory Map in its entirety, enclosed in an attractive cover, for \$9 (Wisconsin residents should add five percent for sales tax.). I invite dealer and computer club volume purchases at discounted prices.

For making inquiries or placing orders, write: Bob Russell, N5474 Stillwater Court, Fredonia, WI 53021.

Reproduction or translation of any portion of this work without permission from R. R. Enterprises is prohibited. While reasonable time and effort has been taken in preparation of this Memory Map to assure its accuracy, R. R. Enterprises assumes no liability resulting from any errors or omissions in this manual, or from the use of the information obtained herein.

Color Computer Memory Map: © 1983 R. R. Enterprises: All Rights Reserved

	Description Cartridge ROM[1]/ Disk Operating System (DOS ends at	013048	SDIC CONT.		*S* Execution of "KILL" Disk BASIC command (Token SD2)	*S* Execution of "SAVE" Disk BASIC command (Token \$D8)	*S* Execution of "MERGE" Disk BASIC command (Token \$D5)	*S* Execution of "LOAD" Disk BASIC command (Token SD3)	*S* Execution of "DIR" Disk BASIC command (Token SCE)	*S* Execution of "CVN" Disk BASIC function (Token SFFA2)	*S* Execution of "MKNS" Disk BASIC function (Token SFFA6)	*S* Execution of "LOC" Disk BASIC function (Token \$FFA4)	*S* Execution of "LOF" Disk BASIC function (Token SFFAS)	*S* Execution of "FREE" Disk BASIC function (Token SFFA3)	*S* Execution of "DRIVE" Disk BASIC command (Token SCF)	*S* Execution of "RENAME" Disk BASIC command (Token SD5)	*S* Execution of "WRITE" Disk BASIC command (Token \$D9)	*S* Execution of "FIELD" Disk BASIC command (Token SD0)	*S* Execution of "RSET" Disk BASIC command (Token \$D7)	
	Beginning Ending DEC HEX DEC HEX ADDR ADDR ADDR	49657 7382	49659 CIFB 49659 CIFD 49661 CIFF	49663 C200	50882 C6C2	515a6 c932	51595 C98B	51610 C99A	52175 CBCF	52506 CD1A	52520 CD28	52534 CD36	52571 CDSB	52672 CDC0	52713 CDE9	53055 CF3F	53130 CF8A	53216 CREØ	53285 D025	
274	Beginning Ending DEC HEX DEC HEX ADDR ADDR ADDR A49152 C003 55279 FEEF Cartridge ROM[1] / Disk Operating System (DOS ends at	(80805)	49156 C004 Address of DSKCC	49364 C0D4 Warn start	49535 C17F 49538 C1DA Disk BASIC Command keyword - token table - ASCII Characters Ref. [7] December 1982 Anniversary Issue	CONTAINS C STRING T 9535 C17F 49537 C181 DIR	182 49542 C185 DRIVE 187 49547 C18B FIELD 187 49552 C190 FILES 191 49555 C194 KILL	9557 C195 49560 C198 LOAD 9561 C199 49564 C19C LSET 9565 C190 49569 C1A1 MERGE	9570 C182 49575 C187 RENAME 9576 C184 49579 C188 RSET 9580 C187 49583 C188 SAVE	9584 CIBS 49588 CIBS WRITE 9589 CIBS 49594 CIBA VERIFY 9585 CIBS 49600 CICS UNIONE	9521 C1C1 49505 C1C5 DSKINI 9507 C1C7 49512 C1CC BACKUP	9513 CICD 49615 C 9617 CID1 49621 C 9622 CID6 49626 C	49527 CIDB 49665 C200 Table of Pointers to subroutine entry addresses associated with Disk BASIC Command Keyword Table	SC200 Ref. [7	Contents 9627 CIDB SCBCF 9629 CIDF SCDE9	9631 CIE1 SCFE0 9633 CIE3 SDØ80 9635 CIE5 SC6C2	9637 C1E7 SC99A LOAD 9639 C1E9 SDØ26 LSET 9641 C1EB SC98B MERGE	9643 C1ED SCF3F 9645 C1EF \$D025 9647 C1F1 \$C932	49649 C1F3 SCF8A WRITE 49651 C1F5 SD55B VERIFY 49653 C1F7 SD146 UNLOAD	20480 C1FV C1FV

R	INPUT/OUTPUT AREA[3] PIA U8	Keyboard Keyboard Keyboard Keyboard	4 = Keyboard row 5 5 = Keyboard row 6 6 = Keyboard row 7 7 = Joystick comparison	are pressed.  Decimal value is 126 or 254 if right joystick fire button is pressed.	Decimal value is 125 or 253 if left joystick fire button is pressed.	BIT @ Control of horizontol @ = IRQ to cpu enabled		1 = Flag set 2 Normally 1 0 = Changes	w 4 m	Bir 7 Horizontal sync interrupt flag	<pre>0 = keyboard column 1 = keyboard column 2 = keyboard column</pre>	BIT 3 = keyboard column 4 BIT 4 = keyboard column 5 BIT 5 = keyboard column 6	6 = keyboard 7 = keyboard	BIT 0 = Control of Sync Clock 0 = IRQ To CPU disabled	<pre>1 = IRQ To CPU enabled BIT 1 = 16.657 MS Interrupt input 0 = Sets Flag on falling edge FS</pre>	<pre>1 = Sets Flag on rising edge FS BIT 2 = Normally 1 Data I/O Register is addressed</pre>	0 = Changes F002 to Data Direction Register BIT 3 = SEL2: (MSB of the two analog Mux lines
nning Ending HEX DEC ADDR ADDR	65280 FF00 65535 FFFF 65280 FF00 65283 FF03	65280 FF00				65281 FF01					65282 FF02			65283 FF03			
Beginning Ending DEC HEX DEC HEX ADDR ADDR ADDR DER DESCRIPTION	49152 C000 65279 FEEF Cartridge ROM[1]/ Disk Operating System (DOS ends at \$5236 D026 *S* Execution of "LSET" Disk BASIC command	(Token \$D4) 53376 D080 *S* Execution of "FILES" Disk BASIC command (Token \$D1)	53574 D146 *S* Execution of "UNLOAD" Disk BASIC command (Token \$DB) 53621 D175 *S* Execution of "BACKUP" Disk BASIC command	53964 D2CC *S* Execution of "COPY" Disk BASIC command (Token \$DE)	D3FF *S* Execution of "DSKIS" Disk BASIC (Token SDF)	(Token \$E0)	"DSKINI" Disk BASIC		54892 D66C 55258 D7DA DSKCON Read or write a 256 byte sector. Ref [5] #9 54981 D6C5 55005 D6DD Restore	SS006 D6DE SS036 D6FC Get Status	55037 D6FD 55044 D704 Delay 78 mSEC 55045 D705 55201 D7A1 Read/write a sector	D7A2 55209 D7A9	D7A2 55203 D7A3 Address of	55205 D7A6 55207 D7A7 Address of Read sector	7A9 Address of	55210 D7AA 55213 D7AD Bit table for drives 55214 D7AE 55227 D7BB NMI Handler	

Beginning Ending DEC HEX DEC HEX ADDR ADDR ADDR ADSR AFROM 645.35 FEFFE TABLET AND CONTROLLED AN	F23 PIA U4[3] BIT 4 = 1 BIT 5 = 1 BIT 6 = NG	Output late  5  #9  0 = Drive  1 = Drive	BIT 2 = Drive select 2 BIT 3 = Motor on BIT 4 = Precomp BIT 5 = Double density BIT 6 = Drive select 3 BIT 7 = Halt enable	65352 FF48 65355 FF48 Disk Contol Registers for 1793 Disk controller chip Ref. (5) #9 65352 FF48 Disk status	65353 FF49 Disk track number 65354 FF4A Disk sector number 65355 FF4B Disk data	65472 FFCØ 65503 FFDF VDG Control Registers for 6883 SAM Address Multiplexer Multiplexer Multiplexer Multiplexer Service Service Service VDG Wode.Register contains 3 pairs of addresses (VØ-VZ). Poking any value to even addresses Set bit OFF (Ø) in VDG circuitry. Poking value to odd addresses set bit ON (I) in 5847 VDG circuitry(3) 65472 FFCØ 65473 FFC1 Control of bit Ø (VØ)	65474 FFC2 65475 FFC3 Control of bit 1 (V1) 65476 FFC4 65477 FFC5 Control of bit 2 (V2)  V0 V1 V2  1 1 1 DAA  1 1 1 DAA  1 1 1 GGR Graphics 6R (PMODE 4)  GGC Graphics 31 (PMODE 2)  1 1 0 G3R Graphics 32 (PMODE 2)  1 1 0 G3R Graphics 33 (PMODE 2)  1 1 0 G3R Graphics 37 (PMODE 1)  0 1 1 GZR Graphics 2R (PMODE 0)
Description	PIA U8 Cont.  BIT 4 = 1 Always  BIT 5 = 1 Always  BIT 6 = Not used  BIT 7 = Field Sync Interrupt Flag	PIA U4[3]  BIT 0 = Cassette data input  BIT 1 = RS232 data output  BIT 2-7 = 6 BIT D/A (.25-4.75 volts out)	= Control = FIRQ to = FIRQ to = RS232 St = Set Flag	Normally 1 Data I/O Registers Sed Changes FF20 to Data Dir Cassette motor control		BIT 0 = RS-232 Data input BIT 1 = Single Bit sound output BIT 2 = Ram size input 0 = 4K 1 = 16K BIT 3 = VDG Control output CSS Color Set Control BIT 4 = VDG Control output GM & NOT(INT)/EXT BIT 5 = VDG Control output GM BIT 6 = VDG Control output GM BIT 7 = VDG Control output NOT(A)/G	Poke 54 to disable auto execute from cartridge Poke 55 to enable auto execute from cartridge BIT 0 = Control of the cartridge 0 = FIRQ to CPU disabled 1 = PIRQ to CPU disabled BIT 1 = Interrupt input 0 = Sets Flag on falling edge of cart 1 = Sets Flag on rising edge of cart BIT 2 = Normally 1 0 = Changes F22 to the Data Direction Reg. BIT 3 = Six Bit sound enable
Beginning Ending DEC HEX DEC HEX ADDR ADDR ADDR THEN THEN THEN THEN THEN THEN THEN THEN	203	65312 FF20 65315 FF23 65312 FF20	65313 FF21			65314 FF22	65315 FF23

Maria de la compansa del compansa de la compansa del compansa de la compansa del compansa de la compansa del compansa de la compansa de la compansa de la compansa de la compansa del	Wett may a feet on the state of
HEX DEC HEX ADDR ADDR ADDR Descrip	HEX HEX ADDR
65280 FF00 65535 FFFF INPUT/OUTPUT AREA[3] Cont.	65288 FERS 65535 FFFF INPUT/OUTPUT AREA(3)
0 1 G2C Graphics 2C 0 1 0 G1C Graphics 1C 0 0 AL Alphanumeric Internal AE Alphanumeric External	65495 FFD8 65497 FFD9 Control of bit R1 RØ R1 1 1
generated by SET instruction \$5 Semigraphic 6	0 1 1 0 0.9/1.8 MHZ 0 0 0.9 MHZ ONLY (slow mode default)
65472 FFCØ 65503 FFDF VDG Control Registers for 6883 SAM Address Multiplexer Cont.	65472 FFCØ 55503 FFDF VDG Control Registers for 6883 SAM Address Multiplexer Cont.
65478 FFC6 65491 FFD3 Page Select Register contains 7 pairs of addresses. (F0-F6) Controls display starting address (binary). Address of upper left most	65498 FFDA 65501 FFDD Nemory size (M0-M1) Poking any value to even addresses sets bit OFF (0). Poking any value to odd addresses sets bit OM (1)
value to even addresses sets bit OFF (a) in Page Select Circuitry, Poking any value to one addresses sets bit OFF (a) in Page Select Circuitry, Poking any value to one addresses sets bit OFF (b) in Page Select Circuitry, Poking and Calect Circuitry	65498 FFDA 65499 FFDB Control of bit MO
o, Basepage is set lary value of F (Bif	MØ M1 64K 0 1 64K 0 1 64K
65478 FFC6 65479 FFC7 Control of bit 0 F0	1 0 16K dynamic memory configuration 0 0 4K dynamic memory configuration
6548@ FFC8 65481 FFC9 Control of bit 1 F1	65502 FFDE 65503 FFDF Register (TY) Map type. Poking any value to addresses sets bit OFF (0). Poking any value to
65482 FFCA 65483 FFCB Control of bit 2 F2	odd addresses sets bit ON (1)
FFCC 65485 FFCD Control of bit 3	0 Normal (ROM selected)
65488 FFDG 65489 FFD1 Control of bit 5 F5	
65491 FFD3 Control	PFF5
65492 FFD4 65493 FFD5 Page #1 Pl control of bit 7	65526 FFF6 65527 FFF7 FIRQ Vector mapped to 49142 BFF6 - 49143 BFF7
F7 @ Normal	1
	55530 FFFA 65531 FFFB SWil Vector mapped to 49146 BFFA - 49147 BFFB
65494 FFD6 65497 FFD9 Clock speed (RD-R1). Poking any value to even addresses sets bit OFF (0). Poking any value to	
5	

# LET'S CLEAN UP THAT TEXT SCREEN

# By Joseph Kolar Rainbow Contributing Editor

ne of the most pleasing things that one can notice in a program is the neatly centered and located text. How disconcerting it is to look at text that is haphazardly tossed on the screen without any thought to its appearance. You've seen it often enough to recognize sloppy text. An otherwise technically well conceived program is belittled with sorry text presentation. To wit: not centered; jammed up in the upper left corner; not ending a line with a hyphen; the left margin being uneven and much, much more.

Good text presentation is very important. Now, fire up your computer and type *PRINT MEM* and ENTER. Copy it down! Copy the three lines, 50 through 54 from the previous *BASIC Corner*.

You should have:

50 PRINT" THE RAINBOW MAGAZINE IS THE"
52 PRINT"BEST MAGAZINE FOR NEWCOMERS TO"
54 PRINT"THE WORLD OF COMPUTING."

First, type *PRINT MEM* and ENTER. Copy it, and *RUN* it. Does it look okay? Did you start line 50 with two spaces? Did you start lines 52 and 54 right after the "?

Note that when writing individual lines, you can't end under the "or you will get a blank row between lines when you *RUN* the program.

HINT: You don't need the final " in the *PRINT* statements. Note that this is *not* true for *INPUT* statements.

Most importantly, it is not necessary to print the sentence above on three program lines. It can be done on one line. Key in line 60:

60 PRINT:PRINT" THE RAINBOW MAGAZINE IS THE BEST MAGAZINE FOR NEWCOMERS TO THE WORLD OF COLOR COMPUTING.

RUN it and see if you have two identical sentences separated

(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)

by a blank row. If not, you know what to do. When you have a good copy, type PRINT MEM, ENTER and copy it.

You can calculate how many bytes of memory you saved from the data you collected. The key to this new technique is the "after *PRINT*. Draw an imaginary vertical line to the right of ". Let's start over! Type *NEW* and ENTER. Key in: 50 PRINT:PRINT".

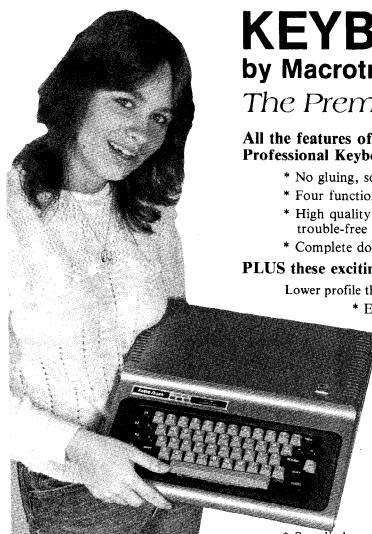
Skip two spaces to start a sentence and type: THE RAIN-BOW MAGAZINE IS THE. Stop and note that you have three spaces to go to reach the imaginary line under the NT". Count the letters in the next word. If the word was a two letter word or if the first syllable had one letter plus a hypen, you could add it. Keep in mind that a space is needed after "THE." There are just two effective spaces before the imaginary line. BEST is a one syllable word with four spaces so it won't fit.

Type in spaces under NT" and you will reach the imaginary linc. Start typing BEST MAGAZINE FOR NEW-COMERS TO. Hold it! We are coming close to the imaginary line. We allow one more space after "TO." That leaves us one more space before we come to the imaginary line. Checking the next word, we find "THE" to be a three space, single syllable word. No good! We go two spaces until we reach the imaginary line and start typing under the B and continue to type. We finish our sentence before we come to the imaginary line. Good work!

By now you have figured out that the imaginary line is our left hand border.

Key in *NEW* and ENTER. We will go, step by step, through the placement of a paragraph using only one program line. Here is the paragraph:

YOU WILL PLEASANTLY DISCOVER, THAT AS YOU PROGRESS, YOU WILL COMMIT MORE AND MORE TO MEMORY. REMEMBER, WITH AVAILABLE REFERENCE MATERIAL, IT IS NOT WRITTEN IN BLOOD, THAT YOU ARE REQUIRED TO MEMORIZE EVERYTHING. ALL YOU HAVE TO KNOW IS WHERE TO LOOK IT UP.



## **KEYBOARDS**

by Macrotron

The Premium Keyboard

All the features of our popular Professional Keyboard:

- * No gluing, soldering, or cutting—plugs right in
- * Four function keys complete the matrix
- * High quality construction assures years of trouble-free operation
- * Complete documentation included

PLUS these exciting new features:

Lower profile than the Professional

- * Extended Radio Shack layout
  - * Silk-smooth feeluses ALPS keyswitches

### Our Versakey software enhances the keyboard's utility

- * Auto-repeat, n-key rollover and type-ahead
- F1 becomes DEFINE, F4 becomes CTRL
- * May define up to 128 keys (including their SHIFT, CTRL, and SHIFT-CTRL combinations) as strings of up to 80 characters each.

* Supplied on cassette, may be copied to disk

"Have Josie ship yours today!"

The Premium Keyboard ......\$89.95 The Professional Keyboard......\$69.95

Versakey software..... SPECIAL! FREE with Keyboard!

Both keyboards carry a 90-day limited warranty.

Please specify your computer's PC board type if known. Otherwise, specify the complete catalog number and serial number.

We have moved to a larger facility in order to serve you better. Please note our new address and phone number.

### **Micronix Systems Corporation**

8147 Delmar St. Louis, MO 63130 (314) 721-7969

Terms: Prepaid check or money order, Mastercard or Visa. Shipping Charges: U.S. \$2.00, Canada \$5.00, COD \$3.50 (No COD's to Canada). One cautionary note. A string of more than 255 characters will just hang up the computer on the line you are keying in. As you will presently see, you will have to back off to the end of the last full line, end the line and start a second line.

Type 10CLS:PRINT:PRINT", skip two spaces to start a sentence and start typing. You have one space to go before the imaginary line. Space it in and cross the imaginary line. Continue keying in "THAT AS YOU PROGRESS, YOU WILL." You have two spaces to get under the T. The first syllable of the next word, COMMIT is three letters, which is not enough. Put in two spaces and begin under the T to type some more.

COMMIT MORE AND MORE TO MEMORY. Only one space to cross over the imaginary line. So, space and under the C keep typing REMEMBER, WITH AVAILABLE REFERENCE. Hold it! We are past the imaginary line. Back up to REF, the first syllable. That leaves us four spaces to get to the imaginary line. The next syllable is ER. REFER leaves us two spaces to go. We need a hyphen so we can type REFER, space, cross the imaginary line and start typing again.

Type ENCE MATERIAL, IT IS NOT WRITTEN. Stop! Right to the imaginary line that time. Good! Key in some more text without skipping a space. We want the next word right after the imaginary line because we know that it is the left margin. IN has to be right at the margin.

Continue typing IN BLOOD, THAT YOU ARE RE-QUIRED. That leaves one space. Space and begin under the I to key in TO MEMORIZE EVERYTHING. ALL YOU. Right on the button!



Since we want HAVE at the left margin, we type H under the T and keep typing. Uh-oh! We typed HAVE TO KNOW IS and can't depress any more keys. We ran out of string space! That's a fine how do you do!

The solution is to back up to the last word on the previous line. Put a closing "after the last word and then put a; space, because a; always allows a leading space.

A new program line must be started, line 20. Key it in and keep typing text; 20 PRINT"HAVE TO KNOW IS WHERE TO LOOK IT. Right on the button again. We cross the imaginary line and since we want the word right up to the left margin, we key in UP under HA.

There are always exceptions to every rule. Remember, I mentioned that you do not need the final "in a print statement? Well, you don't in line 20. But line 10 is an exception

"You've seen it often enough to recognize sloppy text. An otherwise technically well-conceived program is belittled with sorry text presentation."

because, like an input statement, we have to close the statement with a "if we plan to add something else. So type; RUN it! How about that? A lot of work but worth it. When you get your breath back, let us review.

When printing text, type one line at a time. It doesn't matter in what column the "after PRINT is. It could be 20 PRINT" or 20 PRINT:PRINT" or 20 CLS:PRINT: PRINT". The imaginary line is right after the "no matter where it falls, and this is the left margin. Always skip two spaces to start a sentence.

NOTE: Some programmers like to indent two spaces when a new sentence would butt up at the left margin, but some don't

Once you determine where your imaginary line is located, always start your next syllable, word or indented spaces right after the ". Never start punctuation marks, hyphens, parts of syllables (as opposed to an entire syllable) or a single space after the imaginary line.

Determine how much text you can safely fit on the line. Make sure that the line ends with the last letter in a word; a syllable with a hyphen or a punctuation mark to end the sentence. Fill in any blanks with spaces to the imaginary line.

If a punctuation mark ends a sentence right before the imaginary line, make sure you start the next line with two spaces. If a word ends just before the imaginary line, do not skip a space if you want the next word to butt up to the left margin.

If you run out of string space and you are unable to type any more text, back up to the last full line. Put a closing " just after the imaginary line, then put a;. Start a new program line and type right after " and continue.

If you typed this in two program lines, you required 275 bytes. If you typed it in the nine individual lines, you needed 319 bytes. That adds up to 44 saved memory bytes.

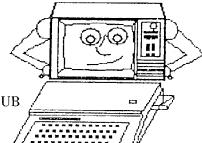
Nice going, indeed!



# INTERNATIONAL COLOR COMPUTER CLUB, INC.



A Non-Profit Educational Corporation
Main Office
2101 E. Main St., Henderson, Texas 75652
Canadian Branch
P.O. Box 7498, Saskatoon, SK S7K-4L4



### WORLD'S LARGEST COLOR COMPUTER CLUB

### HERE ARE SOME GOOD REASONS TO JOIN OUR CLUB

- FREE PROGRAMS: Good programs written by our members are contained in our library, in the newsletter, and on the new member tape.
- 2). NEWSLETTER. A "magazine" sized newsletter (last issue was 80 pages), with programs, tips, data, reviews, articles and much more.
- 3). NEWSLETTER Tape. A tape of all the programs appearing in the newsletter is available from the library for \$2.00 (to members) or \$4.50 (to non-members).
- 4). CLUB LIBRARY. The club maintains a library of programs, books, and Radio Shack ROM—packs. The programs are member written and come six program to a tape or disk. They are yours to keep; however, there is a small fee to cover the postage and tape (or disk) of \$2.00 (\$4.50 for disk). The books and ROM—packs may be checked out for 3 weeks at a time (extensions possible).
- 5). DISCOUNTS.

  You can get large discounts on many software and hardware items for the Color Computer from some of the MAJOR companies. Also discounts on subscriptions to the RAINBOW, Color Computer News, Color Computer Magazine, Chromasette Magazine, and CoCocassette Magazine (up to 25%).
- 6). ADVERTISE FREE. Members may place ads up to ¼ page (classified type) per issue during their entire membership in the newsletter FREE. Display ads at 25% off. These ads must be computer related; however.
- 7). BORROW PARTS. Don't wait weeks for the parts to come in from Radio Shack! Just check them out from the Club's Parts library and return them when yours arrive.
- 8). SURPRISE. You receive a "New Member" package containing many useful items.
- 9). GET HELP. This is the world's largest Color Computer Club. With members in almost every field of expertise. So if you have a problem with the Color Computer, we can almost always get you the answer. Put your problem on the Club's Bulletin Board, write, or call. Telephone No. (214) 657–7834.
- 10). FIND FRIENDS. As a new member, you will receive a list of the members in your area on a quarterly basis whom you may contact for CoCo talk.

#### HOW TO BECOME A MEMBER::::

Write to the club for an application, there are no conditions for membership other than agreeing to obey the rules and by-laws, being interested and paying the dues. The membership dues are \$30.00 (\$50.00 outside the U.S.( In Canada it is in Canadian funds) in U.S. funds) per year and we believe you get more than your moneys worth. You can save more than the memberhip dues in discounts the club offers to you. Example: Subscription to the RAINBOW, 25% off of the regular subscription rates. Some members have told me that the new member tape alone is worth the membership dues. It contains 10 very good programs. Some of the programs contained in the library are Accounts Receivable, General Ledger, Inventory, Sales File and ticket program with automatic Inventory update (for 32K with 2disk). There is over 72 programs in the library to choose from ranging from 4K to 64K w/disk.



# Sea Dragon: Fast Paced Submarine Action

There is much to like about *Sea Dragon*, a new arcade game from Adventure International. Why, then, am I reluctant to tell you to run right out and buy it?

Let me start by extolling the game's virtues—and there are several.

The self starting, machine language game begins with a scoreboard called "The Famous Sailors Hall of Fame." (A bit redundant, but so what?) The top 10 scores will be recorded here.

A very realistic voice comes through the TV speaker saying, "Welcome aboard, Captain!" (Wow! How did they do that?)

Your ears are then treated to a beautiful rendition of "Across the Wide Missouri" and a couple of other sailing tunes. Theoretically, you may at any time begin to play the game by pressing 1 or 2 for the number of players or the letter "P" for the Practice Mode. (Did he say "theoretically?" Ah—we've just touched upon one of Sea Dragon's faults. I'll explain shortly.)

Then you must choose your level of play—from zero (slowest) to seven (fastest). The instructions claim that zero is "easiest," but, personally, I find a slightly higher level such as 2 to be a bit easier. The screen scrolls by faster, but I can also shoot and jump faster. I agree, however, that level 7 is the "most difficult." In a two player game, each player chooses his own level.

Ready to go? Wait just a second. You've got two more

CO CO SERVICE from Creative Electronics Co.

64K Upgrades \$80.00 Installed
32k Upgrades \$30.00 Installed
Extended Basic W/Manual (Write)
Operating Light \$10.00 Installed
Video Interface \$20.00 Installed
Clock Boards \$80.00 Installed
Keyboards \$80.00 Installed
Keyboards \$80.00 Installed
Roms Burned & Installed in
custom Rom Paks (Write)
We recommend C ITOH PROWRITER
printer and Panasonic monitor.
C ITOH Printer \$425.00+Shipping
Panasonic CT-1112 Color Mon.\$360+
shipping.

Fast turn around on all items.
Above prices apply to operating
D,E,F Boards & TDP Computers.
INCLUDE \$5.00 FOR RETURN SHIPPING
SEND S.A.S.E. FOR DETAILS AND FOR
FURTHER OFFERINGS.

CREATIVE ELECTRONICS Co. 4211-7th Ave. Rock Island, II. 61201 choices to make: Music off, yes or no? Joystick or keyboard? Now what's this about "music off?"

Each player gets three submarines (game lives). If you said "no" to the "music off" prompt, then when your first sub appears on the screen, it will be accompanied by a rousing chorus of "I'm Popeye the Sailor Man" (toot, toot!). The loss of each game life is signaled by a few sad notes played in a minor key.

I found that cute the first couple of times, but after that I was glad to have the option of doing without.

At last—here we go! Your mission is to sail through an aquatic minefield and navigate treacherous underwater caverns with a limited air supply, shooting at or jumping over a variety of obstacles, on your way to the ultimate target: the Master Mine.

Choose your weapon. If you want to play with the keyboard, press the spacebar to start the screen scrolling from right to left. Move up, down, left (drop back) or right (forward) with the four arrow keys. The spacebar will fire torpedos straight ahead. The *ENTER* key will send a missile upward to a target above you.

"While it might take a bit more practice," says the instruction sheet, "the keyboard will ultimately provide the best maneuverability." Maybe it will if your fingers are better coordinated than mine. I did much better with the joystick.

The fire button on the joystick starts the action and shoots the torpedos—but you still need the *ENTER* key for the missiles. Maybe with some of the newfangled sticks that would pose no problem, but with the standard Radio Shack stick, since it takes one hand to hold the base of the controller and press the firebutton, and the other hand to work the stick, that doesn't leave any hand free for the *ENTER* key. I tried holding the key down with an elbow or wedging it in with a small piece of paper. That had the interesting effect of launching the missiles at random—and some of them even hit what they were supposed to.

You get from 50 to 500 points for each mine, stalactite, battleship or laser shooter you can shoot, but you'll soon find that there are some obstacles you can't shoot. You can only jump, duck, or run. No points for that, but you stay alive.

You can lose a game life by colliding with any obstacle, with the ocean floor, or with the walls and ceilings of the caverns. You can also get killed by deadly rays from the laser shooters, or by fallout from a mine that you've shot.

Although the instructions don't mention it, the game is played in plateaus. If you lose your sub shortly after starting out, your next game life starts again at the beginning. If you can survive as far as the battleship that guards the entrance to the first cavern, you've reached the first plateau. Now if you get killed, you'll start again at that point. Make it through that cavern, and when you come up for air, you're at the second plateau.

How many plateaus and caverns and obstacles there are before you get to the Master Mine, what happens after you shoot it (for 5,000 points) or what the penalty is for running out of air, I can't tell you, because I just never could survive long enough to find out.

Earlier, I mentioned that there's a "Practice Mode." You get an unlimited supply of replacement subs, and the points don't get posted to the scoreboard. Without the Practice Mode, I'd never have seen the second plateau.

Sea Dragon is not just one game. Actually, it's two! What I have been describing till now is only the first game on the tape, the "novice version." There's also a second game called

the "expert version." It is played exactly like the other, but with more and trickier and deadlier obstacles. Even in the Practice Mode, I've never made the first plateau. Better arcade players than I am will be challenged.

As I said, there's a lot to like about *Sea Dragon*. So what could be wrong?

Unfortunately, Sea Dragon suffers from a couple of major faults that a \$35 program just shouldn't have.

One of them, as I alluded to earlier, is the problem of making the initial selection—one player, two players, or practice. Under the heading of "Beginning the Game," the instruction sheet states: "When the . . . Hall of Fame is displayed on the screen, you may choose the number of players (press 1 or 2), or enter the Practice Mode by pressing P."

Sorry, but it doesn't work that way. When the music that accompanies the scoreboard gets underway, the keyboard response becomes most unfriendly, and unless you happen to hit the key at exactly the right second, you will just have to sit through an entire chorus of "Across the Wide Missouri." Beware of holding the key down in frustration, or you may find that, without meaning to, you have selected one player at level one, or two players with the first player to play at level two.

If you have selected the "music off" option, then when the scoreboard shows up again at the end of the game, it will sometimes do so silently, and you may select your next game easily at any time. But other times, like it or not, the concert and the frustration will start all over again.

Remember that if you didn't turn the music off, each game life ends with a few notes of music as the action pauses. If you are playing without music, then when each sub is sunk,

the screen will jump immediately to the next event—either the next sub, or the scoreboard.

In the early going, that won't make much difference. But what happens after 10 games, or five two player games? Then, of course, it's possible you'll finish with a score that's not one of the 10 best. In that case, since the screen changes instantly when the game ends, you may never see what your score was. That can be very annoying.

I am also not enamored of the packaging. Besides being inconvenient, it may be a contributing factor to the high price. Sea Dragon is supplied on one cassette in a bulky, awkward, vinyl book size storage case designed to hold two cassettes. I much prefer the simple packaging used by Spectral, Mark Data and many other software publishers.

Here, then, are my recommendations to the authors and the publisher:

- —Reprogram the scoreboard audio so that, when the game is first loaded, the concert will play once only, and that all subsequent appearances of the scoreboard will be silent. Amend the instructions accordingly.
- —Reprogram the game action so that when you go down for the third time, the final score will stay up there for a few seconds, with or without the music.

—Sell the game in a simple, convenient, inexpensive package, and cut the price to reflect the cost savings.

If these changes are made, I will then be able to recommend wholeheartedly to my fellow CoCo enthusiasts: Set sail for your nearest software dealer and reel in a prize catch.

(Adventure International, Box 3435, Longwood, FL 32750, 32K ML cassette, \$34.95)

-Neil Edward Parks

### The KEY-264K is here!!

DO YOU HAVE A 32K SYSTEM WITH 64K MEMORY CHIPS ??

ARE YOU STILL BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!!

#### *** Horks with CASSETTE based systems! ***

### *** Works with DISK based systems! ***

The <u>KEY-264K</u> divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the <u>KEY-264K</u> allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the <u>KEY-264K</u> you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Ose either a BASIC command or simple keystrokes to instantly duplicate your program, in it's present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the <u>KEY-264K</u> allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The <u>KEY-264K</u> does this and <u>MORE</u> thru extensions to BASIC. No need to learn a new language! The <u>KEY-264K</u> adds 15 NEW COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The <u>KEY-264K</u> works on 32K systems with "E", "F", or even modified "D" boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS! Systems with piggy-back 32K or half-good 64K memory chips WILL NOT WORK!!

ORDER YOUR KEY-264K CASSETTE TODAY by sending check or money order for \$39.95 plus \$2.00 postage U.S.A. (\$5.00 outside U.S.A.) Mass. residents add 5% sales tax.

KEY_COLOR_SOFTWARE

KEY COLOR SOFTWARE P.O. BOX 360 HARVARD MA. 01451

# Illustrated Computer Dictionary Makes Good Guide

The *Illustrated Computer Dictionary* from the editors of *Consumer Guide* is like one of those pocket sized language guides that helps you say what you mean so you can avoid telling a waiter in Italy that you'll have the boiled alarm clock with a side order of locomotive wheels.

That is to say, it is a simple guide to common computer terminology that will take a normal human being through the labyrinthine channels of a programming article written by a computer specialist. It probably won't cause the meaning of all the jargon to come clear, but it will give you some idea of what's going on.

The very nature of the computer—something very technical and new to human experience—guaranteed that a jargon would grow up around it. To the uninitiated, that jargon appears to be more like a thieves' cant: a language purposely made confusing to all but the select.

The Consumer Guide dictionary (a 180-page, spiral bound paperback) opens up the jargon by patiently and simply plodding through it so that a new user can get a grasp on the terminology. Old hands can learn a thing or two from the dictionary, as well. All too often, we toss around acronyms and jargon without really knowing what we're talking about. It's casy to get deeper into a conversation with Mr. Computer Wizard than we bargained for, then stupidly nod just like we know what's going on. With this guide, at least we may have run across the words before.

As are all *Consumer Guide* books, the dictionary is absolutely non-preferential to any manufacturer. There is very

little manufacturer-specific language defined in the dictionary. Most of the terms are general and applicable to almost any system.

The illustrations in the dictionary are simple, but elegant stipple-shaded line drawings, used to clarify written definitions. The terms are listed alphabetically, but in their most common forms (in most cases). Acronyms are alphabetized as they stand, not in order of the words abbreviated. For example, "EDP" comes after "editor" instead of after "electronic bulletin board" as it would if listed as "Electronic Data Processing."

One of the neatest things about the book is the definition and pronouncing guide to acronyms. It defines acronym as "a word formed from the initial letter or letters of the successive parts (or major parts) of a compound term."

For instance, most of us know that BASIC stands for Beginners All-Purpose Symbolic Instruction Code. All right, class, how many of you knew that "bit" is actually an acronym for Binary DigIT? Shucks, I didn't even know that a nibble is half a byte.

My only criticism is that many of the definitions are skeletal, leaving the reader wondering just exactly what is meant. On the other hand, complex information processing isn't this book's purpose. It's a traveler's guide and it's a good one. I'll surely have a copy on hand the next time I try to translate the native speech.

(Illustrated Computer Dictionary, Editors of Consumer Guide, Exeter Books, NY, 1983, spiral bound paperback, 180 pages, call a bookstore for price)

-Bruce L. Sublett

# Find The COLOR COMPUTER INFORMATION YOU NEED COLOR COMPUTER INDEX COLOR COMPUTER CATALOG

	ican Library and Information Services R, 3705 Mary Ellen NE, Albuquerque, NM 87111
Gentl	emen:
	Yes! Send me COLOR COMPUTER INDEX 1980-1981 at \$5 (Canada and Mexico \$6)
	Yes! Sign me up for COLOR COMPUTER INDEX 1982 (4 issues) for \$16 (Canada and Mexico \$20)
	Yes! Sign me up for <b>COLOR COMPUTER CATALOG 1982</b> (two issues) for \$20 (Canada and Mexico \$24)
	YES! Sign me up for Color Computer Index 1983 (Six issues for \$24—Canada & Mexico \$30)
	YES! Sign me up for Color Computer Index 1983 (Two issues for \$20—Canada & Mexico \$24)
S	ingle Issues:  Color Computer Index \$6 U.S. (Except 1980-1981)  Color Computer Catalog \$12 U.S.
	e
Adar City	<u> </u>
Ui y	VIGIC E(P

## Indexer Will Keep Track Of Your Variables

### Where is the variable ZQ\$?

Indexer is a utility which can answer that question and more! "Which lines in my program make reference to line 275 (or any other line)? Did I ever use the word 'monster' in my program? Where was the keyword 'GOSUB' used?"

Indexer is a powerful machine language utility which cross references a BASIC program. It cross references variables and line numbers and tells in which line number they are used (as in the case of GOTO or GOSUB). Additionally, it will search your program for any word that you want!

Indexer is very useful for final documentation of a program or for debugging. A list of all variables used and line numbers referenced within the program is essential when working on a faulty program. Indexer will provide such a list in a matter of minutes.

The program is a little over 2K bytes long and loads into the top of user RAM. It is written in position independent code (for 16K or 32K machines with or without disks) and can be relocated anywhere.

Load *Indexer* by typing *CLEAR* 200,&H377F (&H777F for 32K). This is absolutely mandatory. If you forget this step, your computer goes off to never-never land! Next type *CLOADM "INDEXER"* (for 32K, CLOADM "INDEXER", &H4000) then type *EXEC*. *Indexer* is now in the "back of the mind" of the computer. At this time you may start entering a new program or load in a previously saved one.

Indexer effectively adds three new keywords to the BASIC vocabulary, @1, @S and @K. Typing @1 causes an indexed list to be created and outputs the result to screen or printer. @S will search the BASIC program for any string up to 32 characters long or search for any BASIC keyword. @K will kill the workings of Indexer and reset all "hooks" back to normal operation.

Like all good utilities, you don't even know that *Indexer* is there until you need it. When you do call on *Indexer*, by typing one of the above three commands, the screen clears and a header appears to let you know you are in *Indexer*.

If the command typed was @1, you are then prompted for certain information. To the prompt "program name?" you may respond with up to 12 characters. Then you will be prompted for the date. Here you may type in up to 18 characters. (I found that using additional text information here helps document the program better.) A final prompt of "PRINTER (Y/N/R)?" is asked. Y=YES, N=NO and R=RETURN to BASIC. If the response is "Y" the printer is checked to see if it is online. If not, "PRINTER BUSY" is displayed. The program now goes into action outputting the cross reference to the printer in a very organized and sequential format. What you now have is a listing of every variable used within your program and in what lines that variable is used. You also have a list of every line number that is called on and the calling line numbers.

### UTILITIES AND GAMES FOR THE COLOR COMPUTER

COLOR COMPOTER
BACKUP\$9.95 Speed up disk backups, helps to recover crashed disks. Bypass I/O errors and fix
Speed up disk backups, helps to recover
many disk problems.
CATALOG\$9.95
An automatic disk file cataloging system.
An automatic disk file cataloging system. File the directories of your disks.
COPYTAPE\$9.95 Copy, merge, and backup your tape based
Copy, merge, and backup your tape based
software. Works even with most popular
pre-loader tapes. CZAP\$9.95
CZAP
how disks work, fix problems on your
disks.
A disk drive speed checking routine.
A disk drive speed checking routine.
Displays on your screen the current,
Displays on your screen the current, average, high, and low speeds of your drive. Complete with instructions for
correcting the speed of your disk drive.
NEATDIR
NEATDIR
directory into alphabetical order. Makes
finding programs on your disks easy.
Keeps your disks in order.
OFFLOAD\$9.95 Create tape backups of your disks. A disk
to tabe, tabe to disk backub system.
ONERR
An error handler for BASIC programs.
Allows your program to receive control
whenever any error occurs. Take control and fix your problems.
TAPEDIR\$9.95
TAPEDIR
program name, length of program, start,
end, and transfer addresses for an
programs on your tapes.  TAPELIB\$12.95
A BASIC tane subroutine append routine
and a starter library of 5 subroutines.
Create your own subroutine library on
A BASIC tape subroutine append routine and a starter library of 5 subroutines. Create your own subroutine library on tape to append to your programs.  TAPEXFER
TAPEXFER\$9.95
matically Great for Chromassette sub
matically. Great for Chromassette sub- scribers, automatically loads an entire
issue to disk.
TREK80C
The classic Star Trek computer game. A
real time game with moving Klingons and
action graphics.
Please add \$1.00 shipping and handling
Please add \$1.00 shipping and handling on all orders. Pa. residents add 6% sales

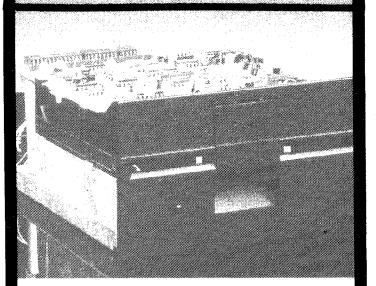
Please add \$1.00 shipping and handling on all orders. Pa. residents add 6% sales tax. Canada orders must be paid in American funds. No COD or charge cards, send check or money order only to:

A.M. HEARN SOFTWARE 602 S. 48th Street Philadelphia, Pa. 19143

Write for a free catalog of these and other products.

Dealer inquiries invited.

# buy a Tandon disk drive for your COCO



40 track fully compatible drive 0 includes a single sided Tandon disk, case and power supply, drive cable, and a Radio Shack drive controller board.

DRIVE 0 \$449. DRIVE 1 \$249.

DOUBLE HEADED DRIVES

DRIVE 0 \$549 DRIVE 1 \$349



64K UPGRADE KIT \$62.95

C.Itoh PROWRITTER \$425. EPSON RX-80 \$399.

Botek Printer adapter \$69.
Use our watts line for a quote
• TM Tandy Corp

### COMPUKIT

COLD

1-713-480-6000 order line 1-800-231-6671 16206D Hickory Knoll , Houston , Texas 77565

ordering information

We accept Visa, Mastercard, Wire Transfers, and Certified Checks for quickest shipping. Orders received on personal checks are held for clearance.

If you answered "N" to the printer prompt, then all the above information is listed to the screen. The information flies by somewhat quickly (as when giving the *LIST* command), but this can be stopped simply by hitting the spacebar at any time. To resume the output, hit the spacebar again. To abort the output, press "A."

The command @S followed by a string up to 32 characters long, will cause *Indexer* to search for that string. If the string is found, operation goes to the BASIC edit mode. At this time you can edit the string as you like (the way you would in BASIC) or hit *ENTER* to keep the string as is and continue the search for another occurrence of the string. You may type "Q" to quit the search when you are in the edit mode. After the last string has been found, you are told that "SEARCH FAILS" and control is returned back to BASIC.

Indexer resets a few RAM "hooks" for its operation. If you should want to return the system to normal operation, then type @K. This will set the hooks back to normal, and defeat the operation of *Indexer*. To restart, type EXEC &H37BF (&H77BF for 32K).

Operational information supplied with the program was good. In addition, memory locations are given for changing the printer output format and baud rate by *POKEing* the proper codes.

If you write long programs and find it to be a nuisance to keep a running list of variables used, then *Indexer* was written for your convenience! I recommend it.

(ML-US'R Software, 115 Rising Sun, Fort Mitchell, KY 41017, \$14.95 tape)

-Al Burzynski



Exciting simulation of jet flight
Navigate a new course each flight or
do aerobatics. Instrument takeoffs
and landings. Variable control
sensitivity for beginner or expert.
Fully instrumented including "Heads Up"
display. Specify 16K or 32K ex. basic.
Tape \$19.95 Direct save to DISK

### LPVII / DMP 100 Descenders

abcdefghijklmnopqrstuvwxyz

User transparent machine language.
Includes CHROUT; a program to modify
ml software, such as Telewriter- 64 th
by Cognitec, to use the DESCENDERS program.
16K/32K TAPE \$15.95 Direct save to DISK

Add \$1.00 for shipping to all orders.

KRT Software 813-321-2840 P O Box 41395 St Petersburg, Fl 33743

# Diamond In The Rough Just Needs Polishing

It's a given fact that you can save a lot of coins by finishing furniture yourself. Plus, you can learn a lot in the process. I guess the same philosophy might just bleed over into the software field somewhat because the product I'm talking about is delivered to you cheap and all you have to do is customize it to fit your particular financial planning needs.

The Household Budget Worksheet, or HBW as it's called by its author, comes as a short, shell of a program with sufficient documentation to allow you to modify the coding to write in your own variable assignments for your expenses (both fixed and variable) and your various incomes. HBW will then give you a printout (on any printer) of the worksheet. No more flipping through a dozen or more screens trying to correlate this and that. Now you can go sit down in front of the "boob tube" and figure out from your worksheet where you're going to get the money to buy that modem or whatever.

Once initially set up by you, following the short steps in the manual, and then re CSAVEd, HBW only requires you to CLOAD it once a month or at your convenience, plug in your actual (or estimated) expenses and income from preassembled data, and without even asking if you're ready gives you a neat printout. That's it. Again: from that first program modification session on, all you have to do is enter the current month, your payment and expense figures, including any unbudgeted expenses, as well as income. Sit back and within a few seconds you've got a tangible printout to be mulled over and filed away.

The more I ran this little program, the more I liked it. It does not have a bunch of bells and whistles nor is there anything elaborate about its documentation, but it does give you something you can hold in your hands and analyze. No file saving; no figuring out a long set of sample personal finance situations just to run the darn thing. HBW is short and to the point. Its bottom line is printed right out in the open for you to see, giving you both itemized and total expenses, itemized and total income, balances due, savings and just how much you have left over to play with. Even tells you how many more dreaded months you'll owe your soul to the bank, Sears, the encyclopedia salesman, company store or whomever.

The program coding is right there in the manual so you can get an idea of what you have to do. Modifying the program is no big deal at all, even for a "newbie" to programming. HBW uses some very unique but simple algorithms to calculate everything for you. It gives you enough room to work with 30 fixed expenses, 20 variable (budgeted and/or charge account) expenses and 20 income itemizations. You can even enter "exception expenses" that you didn't budget for, like a new pair of sneakers for the wife after that new piece of "gotta have" software showed up in the mail.

I didn't like HBW when I first got it. I'm one of those people who'll have the guy at the store assemble the 10-speed before I pick it up. I hate to admit it, but those instructions always seem like so much Japanese to me. So when I read in the HBW's eight page manual that the data loaded into the program is demonstration data and that "all" I had to do is

delete a block of lines and put in my own, I said whoa! I mean, it wasn't too long after I bought my computer that I discovered how truly lazy I am. Why should I pay someone for a chance to program—and not make a cent for myself? I was ready to chuck the whole shebang out the window. The nerve!

But, I decided to give it a fair chance. And I ended up giving it more and more chances. It soon grew on me, because what I had overlooked from the beginning was its sheer simplicity.

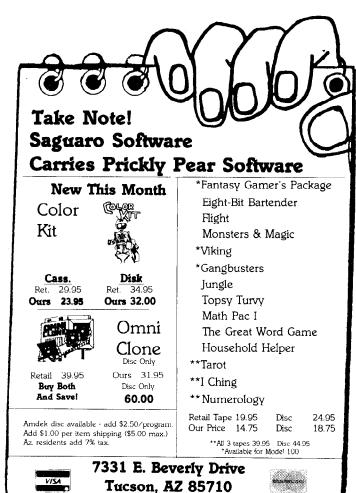
Not too shabby for a wee program that takes up a bit just over 4.2K before running (a minimum of 16K and Extended Color BASIC are required). If you've got disk, you simply transfer it directly to speed up loading with no problem.

If the package had cost much more, maybe I wouldn't recommend it. But at this price, it just might be a gem if you think you can follow instructions and plug this doohickey into that whatchamacallit, and if you still think "budget management" is within your capabilities, just think: you get to do some programming to boot!

So tell, me, what's wrong with unfinished furniture, anyway? The price is right!

(CoCo Data Enterprises, 1215 Emerald Drive, Orlando, FL 32808, cassette only, \$6.95 + \$.75 S&H)

-Ed Lowe



(602) 885-6508

# Number Match Is Ideal For Young Learners

Number Match is a learning program distributed by Micro School Programs. The program requires the user to match a domino pattern with a picture pattern and a numeral. It is intended to help the user develop the concept of numbers, learn to count from one to nine, and recognize the numerals for these numbers. It is geared for the age level of four to six years.

The program is written in BASIC for a 32K Extended BASIC Color Computer, and the first thing that I noticed about it was that it disabled the BREAK key. This is excellent in a children's program because I know from experience that little children love to push that red button.

The program first displays the title and author of the program, and then asks you for your first name. After this, the program asks you to choose a level. (*Easy, Medium*, and *Hard.*) At this point, you can choose to have an example shown to you or to continue on to the lesson. The documentation encourages you to do the example if it is your first time using the program.

You can also choose to have the answer choices change automatically at a set speed or manually at your own speed. I found that the three speeds (Slow, Medium, and Fast) were too fast, and I felt that they should be slowed down. The fast speed was too fast even for me, but then again maybe a six-year-old is more dexterous than I am.

After all of the initial entries, I then called my four-yearold daughter to the computer for a test run. My daughter is familiar with using the computer since we have other educational preschool programs for her. At the start of the lesson, the screen is divided into four sections. The upper half of the screen is divided into three rectangles. The first rectangle contains the level you chose and the score. The second rectangle contains the domino pattern, and the third rectangle contains the numeral. The lower half of the screen contains the picture pattern which can be houses, dogs (I think they were dogs), trucks, fishes, etc.

We started out with the manual speed, and she progressed through the three levels rather rapidly. The differences in the three levels are:

#### Easy:

Given: Domino pattern 1st Match: Picture pattern

2nd Match: Numeral

#### Medium:

Given: Picture pattern
1st Match: Domino pattern
2nd Match: Numeral

#### Hard:

Given: Numeral

1st Match: Domino pattern 2nd Match: Picture pattern

I discussed these levels of difficulty with my wife, who used to be a preschool teacher, and she confirmed that they were correct.

As you progress through a lesson in the manual mode, the domino pattern first appears on the screen. Next a picture pattern appears in the lower half of the screen. If the two patterns match in number, then you press ENTER. If the two patterns do not match, then you press the spacebar to change the picture pattern. If the match made is correct, a happy face will appear at the bottom of the screen. If it is incorrect, a sad face will appear. You will then try again until a match is made.

In the automatic mode, the picture pattern changes automatically at the speed you choose. You then press the space-bar when there is a match.

As I stated earlier, I feel that the progression from manual mode, where you have all the time you need, to the *Slow* mode is too severe and it should be slowed down somewhat. One of the good things about this program is that it is written in BASIC. Because of this, I was able to look at the program and modify it so that the *Slow* mode was at the speed I wanted.

After the session is over, the program reports the results. A record of the number of matches made on the first try will be displayed. The program also prints "I'll see you later" and prints your child's name. My daughter really got a kick out of seeing her name printed by the computer.

The documentation for the program is also written quite well. It takes you step by step through the whole program and also gives you tips on using the program. The only complaint that I have about the documentation is that it is put together backwards. They start out by showing you how to use the program, and then in the back they describe how to load the program. Also, their loading instructions do not work. The directions are:

- 1. Turn the TRS-80 on.
- 2. Put in the diskette.
- 3. Press the RESET button.
- 4. The program will load automatically.

I followed the directions, and it didn't work. I think that these are instructions for loading onto a Model I or III.

In summary, I think that *Number Match* is a worthwhile program to buy. The graphics are very well done, and the program is very well written. If your child goes to preschool, this would be a very good supplement to his or her education. If your child does not go to preschool, this program would be a definite asset in assisting his or her education and preparing for grammar school.

(Micro School Programs from Bertamax Inc., 3647 Stone Way North, Seattle, WA 98103, tape \$24.85, disk \$29.50)

-Paul Lee

82

**SEP 182** 

÷ AUG

## JUST GOOD SOFTWARE

DISK DOUBLE ENTRY - If you have spent hours trying to balance your Debits and Credits, this program is for you! Designed for small business, club, and personal use. Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers. Will handle up to 300 accounts including report headings and totals. Up to 1400 average transactions on a diskette. Summary reports and four levels of subtotals available. REQUIRES 32K and a user understanding of standard double entry accounting concepts. - \$44.95 in BASIC with Machine Language subroutines.

DISK DATA HANDLER - 64K - Designed to use the full 64K RAM, but may also be configured for 32K. Uses standard ROM's - No special operating system required! Allows you to design disk data files for your specific needs. You define a basic record of up to 14 fields and 246 characters. Provides fast selection and sorting based on any field or combination of fields in this record. Powerful on screen input and update. User defined output of reports to screen, printer, or disk files which may be read by your BASIC programs for any computational or special formatting requirements. Printer reports allow headings, page breaks, and page numbering, and let you pass control codes to drive your printer's special features. Maximum number of records you may work with at one time will depend on RAM configuration and record size - 64K (32K) 1850 (500) - 21 char records, 179 (49) - 246 char records. An optional Extended record linked to the basic record may also be defined. The size of this Extended record is not a factor in determining maximum number of records. Will provide the growth capability needed for your increasingly sophisticated applications. \$54.95 in BASIC with Machine Language subroutines.

**DATE-O-BASE CALENDAR** - Puts you in charge of your schedule! Graphically displays any monthly calendar between 1700 and 2099. You put in up to twelve 28 character memos per day - calendar shows where the memos are -call up of day shows details. Use for appointments and a log of past activity. Study the chronology of the American Revolution or note the day your mortgage will be paid off. Search capability allows you to list or print all memos between two specified dates or only ones meeting key word criteria. Date computation shows elapsed time between two dates in days, weeks, months, and years. REQUIRES 32K in BASIC.

TAPE DATE-O-BASE CALENDAR - \$16.95 - (max. 400 memos/tape file).

DISK DATE-O-BASE CALENDAR - \$19.95 - (over 4,000 memos/disk - max. 300 memos/month).

That's INTEREST-ing - Time to let your computer do some real computation! This program will help you solve problems dealing with time, money, and INTEREST. Calculates present value, future value, and capital recovery for any combination of payments you specify. Rate of Return computation to predict how hard your money will be working. Special section to compute bond yields (current and to redemption). Amortization schedules about any way you want them - even allows you to change terms in mid schedule! All answers available on screen or printer. \$29.95 in BASIC.

**MATH TUTOR** • Five programs that go from math fact (+, -, X, /) drill to full addition, subtraction, multiplication, and division at four levels of difficulty. Provides a step by step approach with error correction and rewards for good performance. • \$13.95 in BASIC.

**SPELLING TEACHER -** Up to 200 of their spelling words stored on tape or disk are presented in four lively study modes including a scrambled word game. - \$12.95 in BASIC.

**ALPHA-DRAW** - A subroutine designed to let you easily add characters to your graphic displays. You define X and Y coordinates and a string variable of one or more characters and Alpha-Draw will do the rest. Includes all keyboard characters. Comes with instructions for a true line numbered merge of tape files. Works great with the Screen Print program! - \$8.95 in BASIC.

#### GRAPHIC SCREEN PRINT PROGRAM -

Works in ALL PMODES and lets you shift screen image anywhere on the printed page. Relocatable code lets you use all of your 16K or 32K machine. Available for both Color Basic 1.0 and 1.1. Use EXEC 41175 to see which you have and SPECIFY with order. In Machine Language.

SPECIFY PRINTER TYPE

\$7.95 - For TRS-80° LP-VII/VIII & DMP 100/200/400. \$9.95 - For Epson GRAFTRAX°, PROWRITER°, NEC° PC 8023A-C, Microline° 82A/83A (with OKIGRAPH° I), Microline 84, IDS-440/445, Paper Tiger° 460/560, Micro Prism° 480, Prism° 80/132 (with dot plotting), Micro Peripherals, Inc. 88G/99G, Centronics 739, Star Micronics, Inc. GEMINI-10/15. TRS-80° DMP 120

(Trademarks of Tandy Corp., Epson America, Inc., C-Itoh, NEC America, Okidata Corp., Integral Data Systems, Inc.)

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

We want your SUGGESTIONS!

## Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931 (305) 783-1083



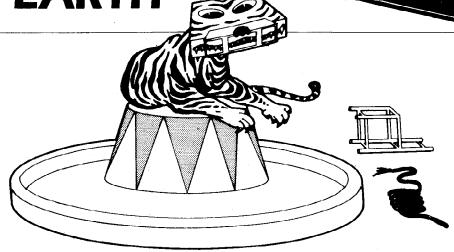


For VISA and Master Card orders: Include type, account number, expiration date, signature and phone number. Sorry! No COD's. U.S. and CANADA add \$1.00 per order for shipping. Overseas \$2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied.



THE GREATEST SOFTWARE DEA ON EARTH

Radio Shac



Tame your computer without breaking your wallet's spirit! Quality programs on tape for the price of peanuts!

A subscription to **Chromasette Magazine** consists of 6 to 8 ready-to-load useful, practical, and fun programs delivered by First Class Mail every month. Programs like Curve Fit, Diggem, Graph Text, List Mod, Robot Run, House Adventure, and Keep Text.

Treat yourself to a great show — get a subscription to **Chromasette** Magazine. Or catch a single act and try a back issue. You'll be delighted by the tricks your computer will do!

The Bottom Line:

1 year (12 issues) \$50.00 Calif. residents add 6% to single copies. North America — First Class postage

6 months

(6 issues) \$30.00 included.

Single Copies \$ 6.00 Overseas — add \$10 to subscriptions and

\$1 to single copies. Sent AO rate.

The Fine Print:

All issues from July 1981 available — ask for list. Programs are for the

Extended BASIC model and occasionally for disks.





P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066 MasterCard/Visa

# Tidying Up Your Word Processor Program

### By D. S. Lewandowski Rainbow Contributing Editor

as possible. If you haven't sent for one all you have to do is send a 37 cents stamp, or two 20 cents stamps, to DSL Computer Products, Inc., P.O. Box 1113, Dearborn, Mich., 48121. I have chosen to leave "edit" out of this month's column, there are some rather interesting things we are going to do with Load and Save.

Okay, if you have entered the June text, follow these steps before entering any more. First delete lines 730 and 740, or if you wish just change them to remark statements as I have done. Also rename line 750 to *EDIT*. Next delete lines 1000

and 1010. Start entering text at 1000.

At line 1000 we will place our text, or prompts. Since we are dealing with cassette I/O, we need a filename, a ready cassette prompt, and of course, an error message in case there is no text in buffer. Moving to line 1060 we find the entry point for the load routine. We point to the ready cassette prompt, and wait for a keypress. Once the routine is entered it will load the first file it encounters on the tape. Now here is an interesting little fact; this is the same routine used to load BASIC and machine language programs. At LOOP4 we keep reading in blocks of data until the pointer for the ROM routine contains something other than \$FF. Once an incomplete block is sensed, we assume we have reached the EOF, or End Of File. At this point we branch to LOUT, or Load OUT. Since the X register is already pointing at the last byte it placed in memory we store it at BUFEN, and jump back to the menu.

Next at line 1320, we find SAVE. The first item we need is a filename so we point the X register at MES4. Then we jump to our PRINT subroutine way back at line 190. Next we perform a little error checking; if the B register is greater than nine the filename is too long, so we simply ask for it again. So far, so good. We prompt for a cassette ready, at WAIT3. Saving a program involves a bit more than loading one. Pointing X at the input buffer, line 1450, we then WAIT for a keypress. Now we start the cassette and write a leader. At line 1500 we point X directly at the text buffer (we already have the number of bytes to save, back at line 1320). Saving

(Dennis Lewandowski, one of the early authors active with the Color Computer, specializes in machine language programming. He and his wife, Rose, founded DSL Computer Products.)

one block at a time we check the VAR after each block to see if it is time to close. Again, if we have anything other than a hex \$FF it is time to close the file. Once finished, or should I say almost finished, we branch to SOUT, or Save OUT. Here we place the End Of File marker and save the partial block, turn off the cassette, and rejoin the main menu.

As I said earlier, these routines are the same routines which save and load BASIC and machine language programs. Try it, notice how your BASIC program looks nothing like a listing. Why? To conserve memory all BASIC keywords are tokenized. These tokens show up as graphic symbols on the screen. Well, that's it for now, have fun, and we'll see you next month.

#### The listing:

<b>Q</b> ØE1	9		8619	9	ORG	\$E00	
			00110	# A SIM	IPLE TEXT	PROCESS	OR IN ASSEMBLY LANGUAGE
		19D6	99129	START	LDY	#BUFF	GET BUFF LOC.
		9E37			STY	BUFST	
		9E39	98148		STY	BUFEN	
øEø(		A928	99159		JSR	\$A928	CLS
ØEØF			99169		LDX	#MES1	PRINT INTRO
ØE12		<b>8</b> 2	99179		8SR	PRINT	DISPLAY ON SCREEN
9E14		ØA				CONT	GO AROUND ROUTINE
ØE 16		80	88198	PRINT	LDA	, χ+	GET BYTE
9E18		<b>9</b> 5	99299		BEQ	DONE	IF ZERO EXIT
ØE 1A		A38A	<b>992</b> 19		JSR	\$A38A	OUTPUT A TO SCREEN
#E1D		F7	99229			PRINT	LOOP TILL DONE
DEIF				DONE	RTS.	RETURN	FROM SUB
<b>9</b> E2 <b>9</b>				CONT		\$A393	ROM INPUT ROUTINE
		<b>#</b> E39	99259		LDY	BUFEN	TEXT POINTER
9E27		80					
	A6		99279	LOOP		, X+	POINT AT INPUT BUFFER
	81		00280		CMPA	#\$5E	UP ARROW?
	27		88298		BEQ	FIN	
ØE2F		66	96399		CMPA	*8	END OF LINE?
	27		99319		BEQ	HORE	BET ANOTHER LINE
	A7		99329		STA	,Y+	
	29		96226		BRA	LOOP	
9E37		9999	99349	BUFST	FDB	Ð	BUFF POINTER
<b>∌</b> E39					FDB	Ø	
	86	ĐD		MORE	LDA	#\$ØD	ENTER BYTE
ØE3D		AØ	<b>##37#</b>		STA	, Y+	
		ØE39				BUFEN	SAVE LOC.
<b>8</b> E43			99399		BRA	CONT	SET TEXT
<b>9E45</b>		99		FIN		#\$66	END OF TEXT
BE47		.A4	99419		STA	, Y	
		<b>0</b> E39				BUFEN	UPDATE POINTER
ØE4D		A928				\$A928	CLS
						#MES3	
ØE53			98459		JSR	PRINT	DISPLAY OPTIONS
9E56	BD	A1C1	99469	TIAW	JSR	\$A1C1	INKEY\$

							1618	66	9195 <b>9</b>	ECD	8	
ØE59 27	FB	99479	BED	WAIT				ØFF4	91969 LOAD	FCB	-	DOINT AT MEDE
9E5B 81	43	99489	CMPA	#\$43	ASCII C		1919 BE			LDX	#MES5	POINT AT MESS
#E5D 27	1C	96498	BEQ	REST	RESTART		191C BD	9E16	91979	JSR	PRINT	DISPLAY IT
9E5F 81	45	00500	CMPA	#\$45	ASCII E		191F BD	AICI	#198# WAIT2	jsr	\$AIC1	INKEY\$
ØE61 192	7 9938	99519	LBEQ	EDIT			1022 27	FB	81898	BEÐ	WAIT2	
9E65 81	4C	99529	CMPA	#\$4C	ASCII L		1924 ØF	7C	61196	CLR	\$7C	BLOCK TYPE
BE67 182		98538	LBEQ	LOAD			1026 86	ØF	91119	LDA	#\$F	15 BYTES
ØE6B 81	50	89549	CMPA	#\$59	ASCII P		1928 97	7D	01120	STA	\$7D	# OF BYTES
8E6D 27	1E	99559	BEQ	PAPER			192A BD	A77C	91139	JSR	\$A77C	SYNC W/LEADER
	53	99569	CHPA	#\$53	ASCII S		192D BE	€E37	01140	LDX	BUFST	POINT AT BUFFER
SEAF B1			LBED	SAVE	Macil 3		1036 9F	7E	91159	STX	\$7E	UPDATE ROM POINTER
9E71 192		99579			ASCII X		1932 BD	A76B	81168	JSR	\$A79B	READ BLOCK
ØE75 81	58	Ø#58Ø	CMPA	#\$58	HOCII Y							
<b>8</b> E77 27	21	00590	936	EXIT			1635 6F	84	91179	CLR	, X	PUT ZERO AFTER NAME
ØE79 20	DB	99698	BRA	WAIT			1937 BE	9E37	01180	LDX	BUFST	
ØE78 8D	A928	88618 REST	JSR	\$A928	CLS		193A BD	8E16	#119#	JSR	PRINT	PRINT NAME
#E7E 8E	9F 29	98629	FDX	#MES2	POINT AT PROMPT		183D BE	<b>∌</b> E37	<b>9</b> 12 <b>99</b>	LDX	BUFST	READY FOR TEXT
ØE81 BD	ØE 16	99639	JSR	PRINT			1949 9F	7E	#121#	STX	\$7E	
gea4 Be	<b>BE37</b>	99649	LDX	BUFST	POINT AT TEXT		1942 BF	7D	#122 <b>#</b>	CLR	\$7D	
#E87 BD	ØE16	98459	JSR	PRINT	PRINT TEXT		1844 BC	7C	61236	INC	\$7C	
ØEBA 7E	9E29	99669	JMP	CONT	ENTER MORE TEXT		1 <b>84</b> 6 BD	A7#B	81248 LOOP4	JSR	\$A7#B	READ BLOCK
9E8D 191		96679 PAPER	LDY	BUFST	PDINT AT START		1949 9F	7E	01250	STX	\$7E	UPDATE ROM POINTER
9E91 A6	A#	88688 LOOP2	LDA	, Y+	GET TEXT		184B BC	7D	Ø126Ø	INC	\$70	FULL BLOCK?
			BEÐ	FINI	ALL TEXT PRINTED		1940 26	<b>9</b> 2	81278	BNE	LOUT	NO = DONE
ØE93 27		99699			SEND TO PRINTER				\$1298	BRA	LOOP4	GET NEXT BLOCK
#E95 BD	A2BF	99799	JSR	\$A2BF	SEND IO LEINIER		184F 28	F5				
ØE98 2Ø		#9719	BRA	LOOP2			1051 BF	ØE39	Ø129Ø LOUT	STX	BUFEN	X=END OF TEXT
9E9A 7E	A#27	99729 EXIT	JMP	\$A#27			1954 BD	A7EB	91399	JSR	\$A7EB	MOTOR OFF
		99730 + DELE	TE 738	TD 748			1057 7E	#E4D	91319	JMP	FIN1	DONE
		60746 *MOVE E	OT TICE	759			185A FC	#E39	Ø1320 SAVE	LDD	BUFEN	GET LENGTH
øE9D BE	ØEA5	98759 EDIT	LDX	*THES			195D B3	ØE37	Ø133Ø	SUBD	BUFST	MINUS START
SEAS BD	ØE16	88769	JSR	PRINT			1969 27	66	91349	BEQ	NOTXT	OPPS
8EA3 28		98778	BRA	MAIT			1962 FD	1#C6	01350	STD	VAR	SAVE BYTE COUNT
	4E	99789 THES	FCC		VAILBLE TILL SEPT ISSUE	OF RAINBON/	1965 BE	ØFE8	#136# REDO	LDX	₽MES4	
9EA5					WHIEDEL THE GET, 1000C	DI (((1.1.11)	1968 BD	9E16	91379	JSR	PRINT	
<b>BECF</b>	90 <b>99</b>	88798	FD9	\$9D##			1968 BD	A393	#138#	JSR	\$A393	GET NAME
ØED 1	29	98899 MES1	FCC	1	A SIMPLE TEXT/							
ØEE8	ØD	9981 <del>9</del>	FCB	\$ØD			196E C1	89	01396	CMPB	#9	CHECK FOR 8
BEE9	20	66829	FCC	1	HANDLING PROGRAM/		1979 2E	F3	91499	BGT	REDO	TOO MANY
					IMADEING / NOONAII		1 <b>9</b> 72 BE	9FE8	91419	LDX	MES4	
0F02	ØD	99839	FCB	\$#D			1075 BD	9E16	Ø142Ø	JSR	PRINT	
6F <b>6</b> 3	2€	99849	FCC	1	by D.S. LEWANDOWSKI/		1078 BD	AICI	61436 WAIT3	JSR	\$A1C1	
ØFIE	#D#D	00850	FDB	\$6D6D			107B 27	FB	91449	BEQ	WAIT3	
ØF2#	26	00860 MES2	FCC	/ ENTE	R TEXT TERMINATE EACH LINE	WITH AN	1070 SE	#2DD	91459	LDX	#\$2DD	POINT AT NAME
				anter.	PRESS * KEY AND PRESS ENTI	FR TO STOP./	1889 9F	7E	91469	STX	\$7E	ROM POINTER
4000		44074	FDD	\$8D88	THESE RET THIS THESE ENTI-	211 10 010/1/	1082 BE	989F	81478	LDX	#\$ØF	# OF BYTES
#F75	9D99	99879	FDB		BOUTTHUE !		1985 9F	7C	Ø148Ø	STX	\$7C	ROM POINTER
<b>9</b> F77	26	66886 HES3	FCC		CONTINUE/					BSR	WRITE	LEADER BLOCK
<b>9</b> F84	øDøD	99899	FDB	\$ØDØD			1087 BD	34	01496			
<b>9</b> F86	29	98798	FCC	/ E -	EDIT/		1989 BE	9E37	81500	LDX	BUFST	POINT AT BUFF
øF8F	ødød	88918	FD8	\$6D6D			198C 9F	7E	Ø151Ø	STX	\$7E	RON PINTER
#F91	20	98929	FCC		LOAD FROM TAPE/		1 <b>98</b> E BD	A7D8	91529	JSR	\$A7D8	MOTOR+SYNC
							1 <b>0</b> 91 0C	7C	#153#	INC	\$7£	PUT 1 FOR DATA
gFA4	<b>9</b> 0 <b>6</b> 0	99939	FDB	\$8D&D			1893 FC	1 <b>6</b> C6	#154# COUNT	LDD	VAR	# OF BYTES
9FA6	29	99949	FCC	/ P -	SEND TEXT TO PRINTER/		1896 188	3 SOFF	9155#	CHPD	#\$##FF	EOF?
ØFBF	60 <b>6</b> 0	99959	FDB	SØDØD			189A 2B	15	91569	BMI	SOUT	IF SO OUT
ØFC1	26	99949	FCC	/ S -	SAVE ON TAPE/		109C 83	ØØFF	91579	SUBD	#\$##FF	-255
ØFD2	eded	98979	FD8	\$ØDØD			109F FD	1906	91580	STD	VAR	BYTES LEFT
ØFD4	28	88988	FCC		EXIT TO BASIC/		19A2 2A	95	#159#	BPL	NEXT	DUMP BLOCK
9FE6								99FF	91579	ADDD	#\$90FF	araay
	9D99	99999 31444 HEGA	FDB	\$6D99			18A4 C3					
9FE8	20	01000 MES4	FCC		ENAME /		19A7 28	<b>Ø</b> 2	91619	BRA	NXT	ACC 54758
øFF2	6 D 6 6	81818	FDB	\$0000			18A9 C6	FF	01620 NEXT	LDB	#\$FF	255 BYTES
8FF4	2₿	91020 MES5	FCC	/ REA	DY CASSETTE /		10AB D7	7D	91639 NXT	STB	\$70	ROM POINTER
1884	<b>6066</b>	91939	FDB	\$8D86	i		18AD 8D	11	<b>8</b> 16 <b>49</b>	BSR	WRT	TO TAPE
1996	4E	91949 ERMES	FCC	/NO 3	EXT IN BUFFER /		10AF 20	E2	9165#	BRA	COUNT	LOOP
****							1081 86	FF	#166# SOUT	LDA	#\$FF	END OF FILE
						_	1983 97	7C	91679	STA	\$7C	MARKER
							1985 8D	89	#168#	BSR	WRT	TO TAPE
	_		_		4-0-1	1	1007 BD	A7EB	91699	JSR	\$A7EB	NOTOR OFF
- [			Æ,	<b>N M</b> 4	cani		18BA 7E	#E4D	81799	JMP	FINI	DONE
1	m/				\$99!					JSR	\$A7D8	MOTOR+SYNC
ı	U	7 1 1		JI	UJJi		tøbd bo	A7D8	01710 WRITE			
						1	10C0 BD	A7F4	01720 WRT	JSR	\$A7F4	SAVE BLOCK
1					omputer to a full 64K for only		1ØC3 9F	7E	61736	STX	\$7E	UPDATE ROM
1	\$99.00 plu	is shipping. (Co	mpare 1	this with l	RS price of \$149 + \$30 labor		10C5 39		91749	RTS		BLOCK SAVED
1	for 32K up	grade.) Board r	nodels l	D, E and F	- No matter what ROM you		1006	9999	01750 VAR	FDB	9	
1	have — Ty	pically 24 hour	turnaro	und — Inc	cludes hardware modification		10C8 8E	1996	91760 NOTXT	LDX	<b>#ERMES</b>	
ı	to access t	he entire 64K, v	with spe	cialsoftw	are and instructions on use of	ŀ	10CB BD	9E16	81778	JSR	PRINT	
ı	the upper:	32K. Pack your	comput	er well. Ir	clude cashiers check, money		10CE BD	AICI	91789 WAIT4	JSR	\$A1C1	
1	order, or p	ersonal check (	allow 2 v	veeksfor	personal checks) for \$104.00	1	10D1 27	FB	#179#	BEQ	WAIT4	
I	(\$99.00+	\$5.00 shipping	) to PYR	AMID. Yo	u may also pay by Mastercard	ŀ	1003 7E	ØE4D	91899	JMP	FINI	
1	or return C	OD. We will tre	at your	compute	r tenderly and rush it back to	ŀ	1905 /E	2570	01810 BUFF	*		
	you.						1220	0.00	\$1019 DOI!	- CMD	DTADT	

90000 TOTAL ERRORS

9E 88

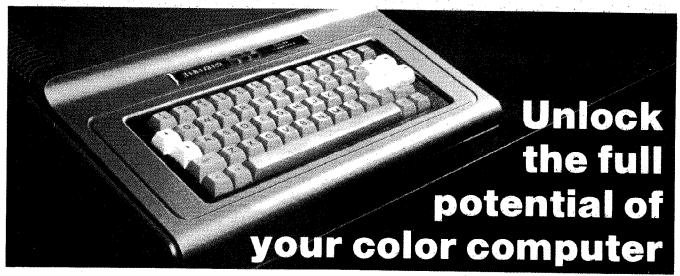
**61826** 

END

START

292

you. PYRAMID — 527 Hill St. - Santa Monica, CA - 90405 - (213) 399-2222



#### It's easy with the right keys.

The HJL-57 professional keyboard instantly upgrades your TRS-80* Color Computer to a dependable, high-performance machine with all the capabilities of systems costing hundreds more.

If you've ever tried to enter a major block of data or do word processing, you know that the keyboard is the major limitation of the color computer.

#### Designed from scratch

To provide a total solution to the problem, the HJL-57 was designed from the ground up, specifically for the Color Computer (not an adaptation of a stock keyboard). The result is a dependable, high-throughput keyboard that makes input less tedious, less time-consuming, and less distracting.

#### State-of-the-art, full-travel technology

A real keyboard with all the feel and response to make you more confident and reduce input errors. Sculpfured, low-profile keycaps are ergonomically designed to cut fatigue and improve typing speed.



#### Compatible with all TRS-80* Color Computers

Including the F-version and TDP-100.* Layout is identical to original CoCo keyboard **PLUS** four software-definable function keys (one latchable), specially positioned to avoid inadvertent actuation.

#### **Built for heavy use**

Manufactured under contract by a leading U.S. OEM, with

*Trademarks of Tandy Corporation

Compare before you buy The HJL-57 was designed with your needs in mind. Why settle for less?						
	HJL-57	Brand X	Brand \			
Switch technology	Full-travel membrane	Mech. contact	Mech. contact			
Warranty	Full year	90 days	90 days			
Function keys	Four (one latching)	None	Four			
Low-profile, sculptured keycaps	Yes	No	No			
Spill-proof centacts	Yes	No	No			
RFVEMI shielding	Yes	No	No			
Contact rating	100 million cycles min.	Not specified	Not specified			
Money-back guarantee	Yes	No	No			

Compiled from manufacturers' published data available at press time.

contacts rated for 100 million cycles minimum, rigidized aluminum baseplate, and spill-proof construction, the HJL-57 comes with a full 1-year warranty.

#### Quick and easy installation

Anyone can remove the old keyboard and easily install the HJL-57 in just a few minutes, and the kit includes a new bezel for a totally finished conversion.

#### RFI/EMI shielded

Meets FCC Article 15 requirements which become effective on October 1, 1983.

#### 15-day money-back guarantee

If you are not completely satisfied, just re-pack it (in original condition, of course) and return it to us within 15 days for a full refund.

#### CoCo owners go professional today

The keys to peak performance are yours for **only \$79.95.**Order now to release the hidden potential and full value of your color computer.



955 Buffalo Road • P.O. Box 24954 Rochester, New York 14624

To: HJL Products Inc		<del></del> -	
☐ Yes, I'm ready to g to my address belo Specify which mod ☐ Original (Sold pri ☐ F-version (after	w. el color compu or to October.	iter you have: 1982)	rd \$79.95
			2.00
			• • • • • • • • • • • • • • • • • • • •
			\$
Payment by:	□ C.O.D.	Check or mo	oney order enclosed
	☐ Visa	☐ MasterCard	—Interbank No
Master Card V.S.A.	Card No		Expires
Signature		· · · · · · · · · · · · · · · · · · ·	Date
Name			
Street Address		<del></del>	
City	· · · · · · · · · · · · · · · · · · ·	_ State	Zip

To order by phone, call (716) 235-8358

Dealer inquiries invited.

## Math Game Is A 'Plus'

Everyone knows that two plus two equals four but did you realize that it really depends upon what you want to teach with that equation. In the cse of Bertamax's Math Games That Teach (Facts Match—Addition), designed for "personalized instruction on personal computers for both home and school," the author has provided a unique way of reenforcing mathematical knowledge of numbers, words and, in this case, additon facts.

The program comes with a well-documented booklet that explains, quite clearly, all particulars of the program. The instructions suggest that an adult explain the program to the child the first time around and then let the child work on his or her own. The age level recommended for this *Math Game* is six through eight and works with addition of the numbers from zero to 18. "No big deal," you say? Wrong. Here is where the author's experience in education shows her ability in understanding what young children have to master with mathematics.

The program screen is divided up into four segments. A large rectangle (bottom) shows the math problems that the child is to work on (graphic numbers—easy to read). The top three rectangles are, left to right, program choice with score, word name for the numeral shown, and on the right side, the numeral that will provide the answer.

## FORMAKER

Transforms plain paper into an invoice (and overdue) order (purchase, mail) quote (list, net, sub) payment record

and stores all the information for easy retrieval later. Figure list, net, discount, subtotals, freight, tax, etc. Extremely user friendly.

16K Extended



\$29.00

(freight included) disc or tape

Best of all, we'll load it with your name, address, CC #, tax # and more to customize this package to your needs - FREE!

#### Challenger Software

1729 Albemarle Rd. Clearwater, FL 33542 or call **(813) 531-7654** 

Open 9 - 9

We'll mail you samples, more information, and a customizing sheet.

In learning math it is necessary not only to learn what one number plus another equals, but also what the words for the numbers are. It is also helpful to be able to look at a number (i.e., 7) and realize that two numbers can be added to achieve that number (5 + 2, etc.). The program permits the user to choose from three levels that will allow you to decide which system you want, pick the answer to the problem and then the word, pick the answer and figure out the problem, or pick the word and get the problem. Right answers get a "happy face" with sound, wrong answers get a "sad face," also with sound. You also have three options for groups of numbers, 0 to 9, 10 to 18, and 1 to 18. The program will also auto-run an example so you will get the hang of how it works.

The author (Kay L. Schrag, M.Ed.) personalized the program by allowing the user to select not only how fast the program will operate, but choice of "manual" so you can move it at your own speed.

A feature that I personally approve of is that the youngster does not have to search out the keyboard to hit the proper number in order to respond to a problem. The numbers are automatically flashed on the screen, and when the proper number appears the child only has to hit the space bar. If the wrong answer is chosen, the program continues until the child gets it right. After all problems are completed (and correctly done) a report screen shows all the equations done and marks an "X" where the proper response was given on the first try.

I tried out the program on my three official program testers, Jennifer, 8, David, 10, and Mike, 12. All three liked the way the program was designed and enjoyed playing it, although Dave and Mike felt it was too easy for them. They liked the faster speeds. Actually they were right, the age level is six to eight and Jennifer fit right in. She used the slow speed and did fine, thinking out the problems and watching for the happy face.

I feel that the program will help children in the primary grades build up confidence with these introductory math and word problems. I would suggest to parents and teachers that a reward system could be developed for students improving their first-try results.

There are a few minor problems that I encountered. First, the program did not load according to the directions for the TRS-80 diskette. I had to list the directory and run the loader program. Second, I do not like the package the program comes in. Not that it is not colorful, clear and concise, but that there is no way it is going to last, especially in a school setting. I would prefer all school programs to use a vinyl "library" holder for protection. The booklet is fine and should be no problem at all. Thirdly, I had to adjust to TV set color in order to get the program's letters clear enough to read.

These problems can be easily resolved and the most important, I feel, is that the program did not load according to the directions.

Micro School Programs, by Bertamax, Inc., has a series of programs for mathematics, reading, telling time, teachers, and administrators. If they are all as well-thoughtout and designed as "Facts Match-Addition" then Bertamax, Inc., (including Kay L. Schrag) has a winner.

(Bertamax, Inc., 101 Nickerson Street, Suite 202, Seattle, WA 98109, tape \$39.50, disk \$39.80)

-Michael F. Garozzo

THE ONE AND ONLY! ROML — ROM PAK Loader

Save your ROM PAKs (or ANY machine language program) on disk then load and execute with ROML

You no longer need to remove your disk controller to execute your ROM PAK software

Also allows you to load from disk or tape and execute all machine language programs which are incompatible with the disk system!

Includes a utility to copy non-protected tapes to disk

Note—ROM PAK execution requires good 64K RAM system.

Copy of article included describing how to access 64K RAM

HANDY!

Tape: \$25.00 Disk: \$29.00

PLUS32— 64K RAM Enabler

Puts your system into the 64k RAM mode. Makes RAM above BASIC available for machine language programs. Runs ROM BASIC from RAM where you can modify it!

Will not crash system if upper 32K is defective or not available

Note—Requires good 64K RAM system Disk: \$19.00

Tape: \$15.00

UNIQUE!

ROMKIL — BASIC ROM disable routine Frees up extra RAM by

Disabling DISK BASIC ROM-returning your system to EXTENDED BASIC, or

Disabling EXTENDED BASIC ROM-returning your system to COLOR BASIC

Allows disk-incompatible machine language programs to be loaded and executed from tape without removing the disk controller

Tape: \$15.00

Disk: \$19.00

USEFUL AND FUN!

BANNER — Creates GIANT Moving Messages

Make your TV a moving Marquee with Color BANNER!

Enter any message and have it move across the screen in GIANT letters in the colors of your choice.

Control speed, delay and pause from within your message!

Great for parties and exhibitions! Tape: \$19.00 Disk: \$23.00

GREAT!

Nelson's SUPER "COLOR" LIBRARY Super "Color" Writer II*

**ROM PAK: \$89.95** Disk: \$99.95 By far the BEST word processor available for the Color Computer,

- Super "Color" Mailer Tape: \$39.95 Disk: \$59.95

Powerful multi-purpose mailing list merging & sorting program. Uses SCWII files.

- Super "Color" Speller Disk Only: \$69.95

Fast, proofreading program. Proofs against a stock dictionary, plus one you design. - Super "Color" Calc*

**ROM PAK: \$89.95** Disk: \$99.95 The finest electronic worksheet you can find for the Color Computer Rivals VisiCalo

· Super "Color" Terminal* Tape: \$49.95 **ROM PAK: \$59.95** 

Disk: \$69.95 Makes communicating with ANY computer a breeze

- Super "Color" Disk-ZAP

Disk Only: \$49.95 The ultimate repair utility for simple and quick repair of all repairable disk errors.

 Super "Color" Database Disk Only: \$79.95

Data sorted in records you design. Can be used to: sort, do math, create reports, and much more. *Supports four different screen sizes: 32X16 and 51-64-85X21, with lowercase!

BEST!

 LCA-47 — Lower Case Adapter
 Provides real lowercase letters with true descenders!
 Compatible with ALL Color Computer Software!
 Provides bright characters on a dark background!

Superb User's Manual included.

Easy 5 minute installation!

Uses NO system memory

1 year warranty. Hundreds of owners, all happy!

Assembled and Tested: \$75.00

SAVE!

SPECIAL — Save \$25.00 when you purchase Super "Color" Writer II and an LCA-47 at the same time! Order NOW!

FOR HOBBYISTS! PP-16 — EPROM Programmer

Programs single supply 2516, 2716, and 2758 EPROMs.
Program—entire or partial. Auto verify after programming. Transfer contents to RAM for modifying or duplicating.

Select Documentation for:

Interface to: 6502 6820 PIA or 6522 VIA

6800

6809 8080/8085/Z80

6820 PIA 6820 PIA 8255 PPI

Comprehensive documentation booklet contains schematic, instructions for construction, check-out and use, and a well commented assembly listing for the specified MPU

Note—User must supply the specified parallel interface Specify MPU and computer system when ordering

Complete Kit (includes ZIF socket): \$45.00 PC board only (with documentation): \$25.00



#### Micro Technical Products, Inc.

123 N. Sirrine, Suite 106-A Mesa, Arizona 85201

Phone: 602-834-0283





Add 5% for shipping, minimum \$2.00. Overseas 10%, minimum \$4.00. Arizona, add 5% tax.

## LETTER SETTER TYPESET THIS AD

With LETTER-SETTER'S big bold headlines and your own unique text, you can print a message that no one will ignore!



#### Qualities:

*

¥

*

×

×

×

×

×

- LARGE, CLEAR LETTERS
- EASY TO USE
- THREE PRINT SIZES

#### Requirements:

- 16K EXTENDED COLOR BASIC

¥

×

×

×

*

- DOT ADDRESSABLE PRINTER
- YOUR IMAGINATION

#### lises:

- REPORT HEADINGS
- FLYERS
- CHURCH BULLETINS

•••					
×	PLEASE S	END	ME LETTER-	-SETT	ER!
¥					
¥	Name:				
*					
*	Address:			····	
*					
*	City, Stat	e:			
*					
*	PRINTER T	YPE			
*					
*	*	6	\$39.95/ea	ROM	PACK
*					
*	*	a	\$24.95/ea	on	<b>TAPE</b>

#### BERNIE LITTON

<del>*******************************</del>

P.O. BOX TWO

CHICAGO, ILLINOIS 60690

(312) 944-2444

## Spelling In Context Impressive

Spelling In Context, Level 2 (Grade 2) is designed to teach spelling in the context of a sentence. Using this method teaches a student the proper spelling and meaning of a test word. There are 40 lessons and 400 words in this Level 2 program. Common second grade words are used. Users cannot readily change words or sentences in Spelling In Context.

Each word is flashed on the TV screen for a brief period of time. When the word disappears a sentence is displayed. The sentence has a blank where the test word should appear. The student types in the word and presses ENTER on the keyboard. If the word is correct, a positive reinforcement statement is displayed and the student is allowed to proceed to the next word. On the other hand, if a word is mispelled a corrective message is given. The word is flashed on the screen a second time and the sentence is displayed again. If the user misspells the word a second time, the correct spelling of the word is presented at the bottom of the display. The student will not be allowed to proceed to the next word until the misspelled word is spelled correctly. If a student scores less than 90 percent on the lesson, the misspelled words are reviewed at the end of the lesson.

I play-tested Spelling In Context, Level 2 on Stacey, the niece of my upstairs neighbor. This was Stacey's first contact with a computer. I'm happy to report Stacey wants her mother to buy a computer and her mother is very responsive after seeing the CoCo in action. With very little tutoring Stacey was running the program like a pro.

Spelling In Context, Level 2 uses the extra color set of PMODE 3: black, blue, orange, and buff. Text is displayed in upper and lower case. Some text lettering is hard to read. This might be corrected by increasing the size of the letters. I found it hard to read the blue text on the black background. The buff and orange text read OK on the black background.

Everyone involved in testing Spelling In Context, Lever 2 was impressed with the overall program. It is obvious that much time was spent selecting the spelling words and text used in this program. The program material includes a well written manual. The sound and musical tunes generated by Spelling In Context are adequate.

I think more positive reinforcement should be given for high scoring. Additional sound or graphic routines could give the added reinforcement. Stacey was a little let down by the ending routines used with this program.

Bertamax Inc., the producers of Spelling In Context, Level 2, has a large line of educational software available for the CoCo. If these programs are as well thought out as Spelling In Context, Level 2 they will make a welcome addition to a program library. Most Bertamax programs are available on tape or disk.

(Bertamax Inc., 101 Nickerson Street, Suite 202, Seattle, WA 98109, 32K tape \$45.50, disk \$49.50)

-Gabriel Weaver



#### **DRAGON 32 MICROCOMPUTER REFERENCE CARD**

A sparkling, beautiful 9-color card, with red-orange background, 18 pages, on 80 lb. Beckett cover-stock, stretch-wrapped in plastic for protection until you open it. We have everything but the kitchen sink on this card.

It should save you hours of time, and it fits in your pocket. You have to see it to believe it. (And it has the famous "Magic Number".)

#### PLEASE SEND ME

COPIES	CARDS	PRICE
	DRAGON 32 £3.95	\$5.95
	TRS80 COLOR BASIC & EXTENDED	\$4.95
· · · · · · · · · · · · · · · · · · ·	001111000005 1110 00	
	COMMODORE VIC-20	\$5.95
	ZX80, ZX81, & TS-1000	\$5.95
	HEATH/ZENITH HDOS 2.0	\$5.95
	APPLE II & II PLUS BASIC & 6502	\$4.95
	APPLE II & II PLUS BASIC	\$3.95
	Z80 MICROPROCESSOR	\$4.95
	6502 MICROPROCESSOR	\$4.95
	TRS80 MOD II 3-CARD-PACK (B&A, SVC, C&U)	\$11.95
	TRS80 MOD I BASIC & ASSEMBLER	\$4.95
	TRS80 MOD III BASIC & ASSEMBLER	\$5.95
	TRS80 POCKET BASIC (PC-1) [SHARP PC-1211]	\$2.95
	TRS80 MOD I BASIC	\$2.95
	TRS80 MOD III BASIC	\$3.95

HOW TO GET A NANOS SYSTEMS REFERENCE CARD

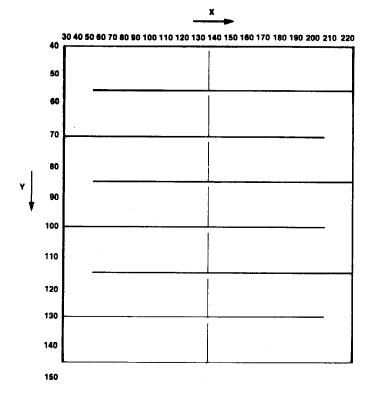
1. 2. 3. 4.	DEMAND ONE AT YOUR COMPUTER STORE. DEMAND ONE FROM YOUR BOOK STORE DEALER. ASK YOUR MAGAZINE FOR ONE. ORDER FROM US.
	SEND CHECK OR MONEY-ORDER: (C.O.D. ALLOWED FOR \$25 OR MORE) (NO CREDIT CARDS)
	NANOS SYSTEMS CORP. P.O. BOX 24344 SPEEDWAY, IN 46224 (PHONE 317/244-4078)
	ADD \$1.00 PER CARD FOR SHIPPING/HANDLING.  (OUTSIDE OF NORTH AMERICA, ADD \$2.00)  (INTERNATIONAL MONEY ORDER ONLY)
	• Indiana residents add 5% sales tax.
	YOUR NAME AND ADDRESS

WHEN YOU SUBTRACT THE NUMBER OF A GRAPHIC FROM THE "MAGIC NUMBER" THE RESULT IS THE NUMBER OF ITS REVERSE OR INVERSE GRAPHIC



(Don Inman is the acknowledged master of microcomputer graphics and the author of a large number of books, including TRS-80 Color Computer Graphics and Assembly Language Graphics for the TRS-80 Color Computer with Kurt Inman.)

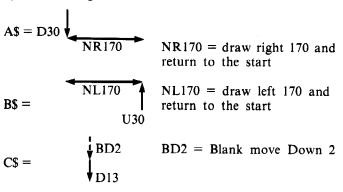
Figure 1 — Closed Can With Baffles



At the top of each baffle, a small space is provided for the paint to move from right to left or from left to right. At the side of each baffle, space is left for the paint to move upward or downward. The can with baffles will be drawn with the following program lines.

PMODE 3,1 'set the mode PCLS: SCREEN 1,14 'clear screen - color set 1 A\$="D3Ø; NR17Ø" 'define strings B\$="U3Ø; NL17Ø" left side C\$="BD2; D13" bottom, right, top DRAW"BM3Ø, 4Ø; XA\$; XA\$; XA\$; " 'center DRAW"D15;R19Ø;XB\$;XB\$;XB\$;U15 ;L190" DRAW"BM125, 40; XC\$; XC\$; XC\$; XC\$ ; XC\$; XC\$; XC\$; "

The greatest part of the can is drawn using pieces formed by the substrings:



These substrings are called by the *DRAW* statement by XA\$, XB\$ and XC\$.

The idea behind our baffled can is to investigate how the *PAINT* statement will fill the can. If you start the fill at different points within the can, will the order of fill change?

You might give each section of the can a number. Then start painting from a different section each time. As an example, I numbered the sections as follows:

13	14
12	11
9	10
8	7
5	, 6
4	3
1	2

If you start painting in section 1, will the order of fill be: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14?

The Baffled Can program that follows may be used for your investigation. Two inputs are requested. After the can has been drawn, the computer asks:

#### PAINT FROM WHERE (X,Y)?

Input the X,Y coordinates for the point at which you wish to start painting. The compute will then ask for a color code.

## PAINT FROM WHERE (X,Y)?127,144 COLOR(6,7,8)?

Input one of the color codes: 6, 7, or 8. Then watch closely as the can fills with paint.

```
99 REM-SET SCREEN AND VARIABLES
100 PMODE 3,1
110 PCLS:CLS
12Ø A="D3Ø; NR17Ø"
13Ø B#="U3Ø; NL17Ø"
14Ø C$="BD2; D13"
                           semicolon must follow
15Ø
                           each substring—even at
199 REM-DRAW CAN
                              the end of a line
200 DRAW"BM30,40;XA$;XA$;XA$;"
21Ø DRAW"D15;R19Ø;XB$;XB$;XB$;U1
5; L19Ø"
22Ø DRAW"BM125,4Ø;XC$;XC$;XC$;XC
$; XC$; XC$; XC$; "
23Ø '
299 REM-GET INPUTS
300 INPUT"PAINT FROM WHERE (X,Y)
";X,Y
31Ø INPUT"COLOR (6,7,8)";C
32Ø
399 REM-PAINT
```

400 SCREEN 1,1

41Ø PAINT(X,Y),C,8

42Ø

499 REM-PAUSE

500 I\$=INKEY\$

510 IF IS="" THEN 500 ELSE 110

press any key to PAINT again

The following inputs are suggested for the beginning X,Y coordinates. Use any color you wish. If you are quick enough, you might tabulate the order in which the sections are filled.

Starting Section	X,Y	Order of Filling
1	123,144	
2	127,144	
3	127,129	
4	123,129	
5	123,114	
6	127,114	
7	127,99	
8	123,99	
9	123,84	
10	127,84	
11	127,69	
12	123,69	
13	123,54	
14	127,54	

Hint: Widen the gap between the center baffles, and you may be able to see what's going on.

#### **Paint Shop**

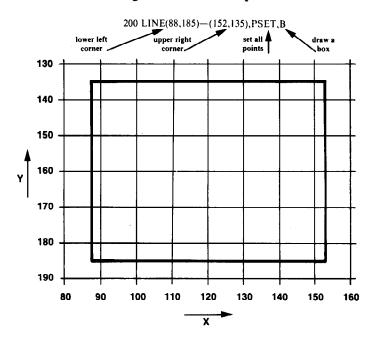
The next program is a variation of Program 6-2 which appeared in Chapter 6A of "TRS-80 Color Computer Gra-

Co Co - Cooler Brings operating temperature to ambient, regardless of accessory load Reduces temperature of ENTIRE computer . . . not just the SAM chip \$39.95 Easy 1-minute installation Companion Keyboard Cover \$7.95 Co Co Software Send For Free Catalog
 For Fastest Service Send Money Order Or Certified Check • Add \$2.00 Shipping Charge Per Order ● Calif. Residents Add 6½% Sales Tax ● All Merchandise Shipped From Stock • REM Industries. Inc. 9420 "B" Lurline Ave., Chatsworth, CA 91311 (213) 341-3719

phics." An automobile paint shop is drawn at the lower center of the screen. An unpainted car drives in from the right side of the screen. A door of the paint shop opens, and the car enters. The car is painted a random color in the paint shop. Then a second door opens, and the painted car leaves the paint shop and exits to the left of the screen.

The rectangular paint shop is drawn (see Figure 2) by the LINE statement:

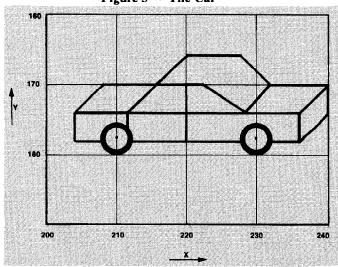
Figure 2 — Paint Shop



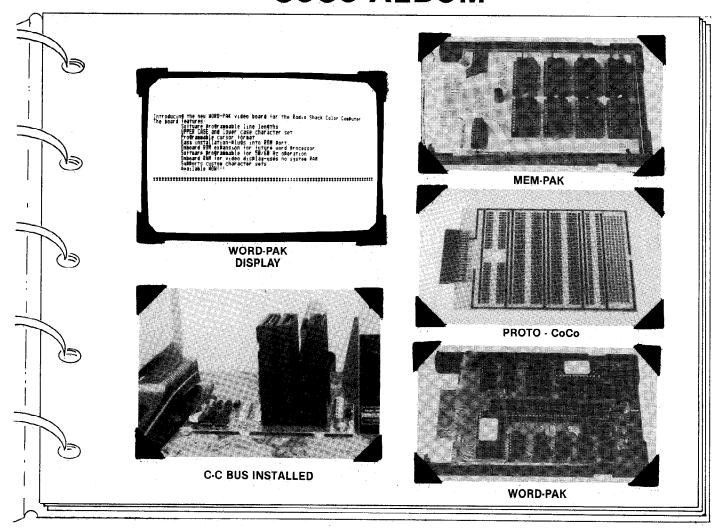
The unpainted car is drawn in the lower right corner of the screen as shown in Figure 3. This is accomplished by one long *DRAW* statement and two *CIRCLE* statements. The drawing starts at position (208,170).

- 300 DRAW"BM 208,170;R8E4R8F4R8G4L8NE4; H4L8G4L8NE4D4R4BR4NU4R8NU8; R8BR4R4NU4E4U4G4L24"
- 310 CIRCLE(210,178),5: CIRCLE(230,178),5

Figure 3 — The Car



## CoCo ALBUM



#### **WORD-PAK**

80 column video board for the Radio Shack Color Computer. No longer do you have to sacrifice valuable memory and strained eyesight to expand the video display of your computer. The board features:

- · Full ASCII character set (also supports custom character sets for user specific applications)
- Programmable line lengths and cursor formats
- On-board ROM expansion for future word pro-
- 50/60Hz operation
- Easy installation-plugs into ROM port
- · Available for cassette or disk based systems (disk systems require the use of a 'Y' connector or expansion bus)
- · Contains it's own video RAM-requires no system RAM

The WORD-PAK produces a composite video signal and requires the use of a monitor capable of displaying 80 columns of text.

Think of the applications!!

Price: \$169.95

#### **MEM-PAK**

16K RAM/ROM expansion board. Expand RAM (for unmodified Rev. E and older computers) or put your programs/utilities in ROM for instant loading. Utilizes 24 pin, compatible RAM/ROM/EPROM memory devices.

Price: \$114.00 (with 16K RAM)

#### P-C PAK

Parallel printer port and real time clock. Free up your serial port by adding this Centronics compatible parallel port to your computer. The board also features a real-time clock with battery back-up capability (optional).

Price: \$122.95

#### C-C BUS

A fully buffered, six slot expansion bus for your CoCo. Each slot is software selectable, allowing up to six cartridges/accessory boards to be installed simultaneously with no contention problems. The bus also supports boards designed to use the high memory (HFF60-FFBF) area as I/O. Simply connect the C-C BUS to the ROM port** and you can expand memory (up to 128K for Rev E and older computers that can 'write' to the ROM port), add a parallel port, EPROM programmer, voice synthesizer.... you name it, and software select the one you want to use without having to turn the computer off to change cartridges.

Think of the potential!!

Price: \$125.00

Option 1. Power supply

PROTO-CoCo

The C-C BUS can use either the computers power supply (this will limit the number of devices you can install on the bus) or an onboard power supply.

Option 2. Molded plastic cover

Requires S-cable (below)

- Prototyping board with all the features.
  - 20 sq. inches of prototyping areaAll signals identifyed on board
  - Designed to fit inside a disk controller case. Gives your finished prototype a professional look.
  - · allows either point-to-point wiring or wire-wrap.

Price: \$14,95

#### **ACCESSORIES**

\$29.95 S-cable \$19.95

#### SPECIAL:

**BMC Model 12A Monitor** ONLY \$89.00 with purchase of a Word-Pak

#### MAIL ORDERS:

Send check, money order, MASTERCARD/VISA (include card number, interbank number, expiration date and signature) for total purchase price, plus \$2.50 for shipping and handling (Canadian orders please add \$5.00). New Jersey residents add applicable sales tax.

P.O. BOX 813 N. Bergen, N.J. 07047 (201) 330-1898

Color Computer is a Trademark of Radio Shack a Division of Tandy Corp.

#### **UTILITIES+ FOR EXTENDED BASIC**

#### **#UK2 COLOR KRUNCHER — \$12.95**

- Reduces Memory Requirements of Any Ext. BASIC Program—Speeds Program Execution Time
- -Type In A Program From A Magazine, As Is, Debug It, Then Let KRUNCHER Make It Shorter
- -Includes LN.XREF and REM.REMV (#UR2)
- -Includes "EXTENDED BASIC FASTER" (#F1)

#### #F1 "EXTENDED BASIC FASTER" — \$3.95

- -The First Published Proven List of Methods YOU Can Can Incorporate Into All Your Own Ext. BASIC Programs For Maximum Speed Efficiency
- —For Novice or Experienced Programmer
- For Graphics or Non-Graphics Programs

#### **#UV4 VARIABLE CROSS REFERENCE — \$6.95**

- -Locates All Variables And "Where Used" Line #'s In Your Ext. BASIC Program
- Optional Variable Only List (No Line #'s)
- -Automatic Sort-Optional Printer Output

#### **#UF2 LLIST FORMATTER — \$9.95**

- -User-selectable Margins, Page Lengths, Top-of-Form, Font Size, Line Length And More
- -Title And Date Your Important Listings
- -Start And Stop Listings At Any Line #
- Optional Space Between Lines—Hilights Line Numbers-Opt. Single-Sheet Pause-For Most Recent Printers (can be user modified)

#### **#UR2 LINE CROSS REFERENCE — \$7.95**

- Provides A Sorted Listing Of All Referenced Line Numbers-Optional Printer Output
- -Includes Optional REM.REMV-Removes All Unreferenced REM's And Comments And
  - -Removes Comments From Referenced REM's
  - -Includes Optional Line Protect Feature

#### **#UD2 DISK DIRECTORY WITH BYTES — \$7.95**

- -Gives Same Info As DIR, PLUS Individual File Bytes, PLUS Free And Used Total Files, Grans, And Bytes, PLUS Opt. Disk Name, PLUS To Screen Or Printer
- -One Screen At A Time (No More Frantic SFT/@)
- -Includes Separate DISK NAME Program

#### #US3 COPY/SEARCH/REPLACE/DELETE — \$7.95

- -Same As Disk COPY, But To-and-From Disk OR Tape -For ASCII Textfiles Or Programs Or Datafiles
- -Search OR Search & Replace (optional) OR Search & Delete (optional)
- Excellent For Changing Long Variable Names
- -Great For Changing Spelling Or Capitalization

#### #H1 VIDEO*CLEAR — \$14.95

-Computer Associates' VIDEO INTERFERENCE REJECTION CABLE—Reduces Or Eliminates Picture Interference Caused By Serial Or Disk Cables-External TV Cable Replacement—No Soldering—2 Min. Installation-For 75 Or 300 Ohm TVs Or Monitors-Nothing Extra To Buy-Price Includes Shipping-Qty. Disc. Avail.

ALL PGMS (EXCEPT #UD2) FOR EXT. BASIC TAPE/DISK

#### BUY 3 OR MORE ON THE SAME ORDER & TAKE 10% OFF

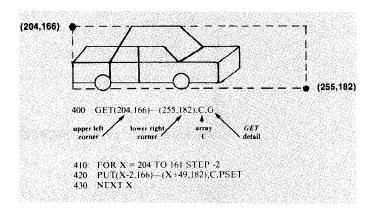
(Post Paid in U.S. & Canada) (PA Residents Add 6%)

Send Check Or Money Order To:

#### MICROLOGIC

Box 193, First Avenue East Brady, PA 16028 (412) 526-5781

The car is moved to a point in front of the paint shop door by one GET statement and a series of PUT statements using a FOR-NEXT loop. A step of two X values was used to move the car. The GET and PUT statements include a blank area at the rear of the car so that a separate PUT statement would not be needed to erase the "old" car when it is moved to a new position.



Notice that the size of the PUT and GET arrays are each 51 by 16. The array is dimensioned in line 120 by:

#### 120 DIM C(22)

A single dimensioned array may be used. The size of the array is roughly calculated from the size of the areas used in the *PUT* and *GET* statements from:

(length * width) / k where 
$$k = 40$$
 for PMODES 3 & 4  
= 80 for PMODES 1 & 2  
= 160 for PMODE 0

In this case: length = 
$$255-204 = 51$$
  
width =  $182-166 = 16$   
k =  $40$   
 $(51*16)/40 = 816/40 = 20.4$ 

22 was actually needed

A series of *PSET* statements (using the background color) opens the garage door.

- 500 FOR Y = 185 TO 160 STEP -I
- 510 PSET(152,Y,1) background color
- 520 NEXT Y

The car then moves inside, and the shop door is closed by using the foreground color:

- 700 FOR Y = 160 TO 185
- PSET(152,Y,4) ______foreground color 710
- 720 NEXT Y

The car is then painted by:

- 730 R = RND(3)+1colors 2, 3, or 4 740 DATA 107,172,119,168,131,172,135,174,131,
- 176,121,176,113,176,103,176,107,178,127,178
- 750 FOR N = TO 10
- 760 READ A,B
- 770 IF N = 9 THEN R = 2 wheels always color 2
- 780 PAINT(A,B),R.4
- 790 FOR W=1 TO 50; NEXT W _____ time delay
- 800 NEXT N

After the car is painted, the opposite paint shop door opens, and the car exits. The car seems to disappear by GETing a fixed area and PUTing it two places to the left.

## WHAT'S HOT THIS SUMMER? TAKE A LOOK!!!

### **SOFTWARE**

The Official

#### ZAXXON

by SEGA (from Datasoft)

Probably the most incredible arcade game ever is now available for the Color Computer. NOTE: this is the official ZAX-XON, not an imitation!

Now Only .... \$29.95

#### THE KING

by Tom Mix Software

Four full graphic screens. Exciting sound and realistic araphics. Never before has the color computer seen a game like this.

Tape ......\$26.95 

#### **SKY-DEFENSE**

Can you survive the first wave of attack? Or the next? Or the next? Only your joystick will ever know! Features horizontal flight in highres graphics, and fast-paced action. Machine language; joystick required. 16K..... \$12.95

#### **BIGNUM**

If you dislike seeing numbers like 1.23045 E 23, and wish you could have all the accurate digits instead, then BIGNUM is for you. Add, subtract, multiply, divide and raise BIG numbers to BIG powers and get totally accurate results. Even if you are satisfied with an approximation, without this program the Color Computer would return an "OV ERROR" with this problem: 34 \$45. BIGNUM returns the entire 68 digit result! Accurate to 1,024 digits in 16K & about 3,068 digits with 32 RAM.

16K.........\$**9.95** 

#### **HARDWARE**

#### **16K-32K UPGRADE KIT**

Kit includes 8 200 ns #4116 Factory Prime Chips, pigaybacked sockets, SAM socket. and "32K" button to replace the 16K on your computer's case. Easy to remove. 

#### 64K UPGRADE KIT

200 ns #4164 chip set will upgrade your "E" board easily. Factory Prime Chips. Instructions included ...... \$49.95

#### Nanos Reference Cards

Color Computer & TDP-100 Color BASIC & EXTENDED . . . . . . . . 4.95

#### **DATA CASSETTES**

CO₅ C10 \$ .65 . . . . . . . Qty. 1-10 . . . . . . \$ .70 Soft Poly Cases ..... Ea. \$ .20

#### WABASH DISKETTES

#### JOYSTICK INTERFACE

Use ATARI or WICO Joysticks with your COCO! (Can interface 2 joysticks) . . . . \$19.95

#### WICO COMMAND CONTROL **JOYSTICK**

The best joystick available for COCO...

\$29.95

Add \$1.50 per software order and \$2.00 per hardware order for postage and handling.



California residents add 6% Sales Tax.

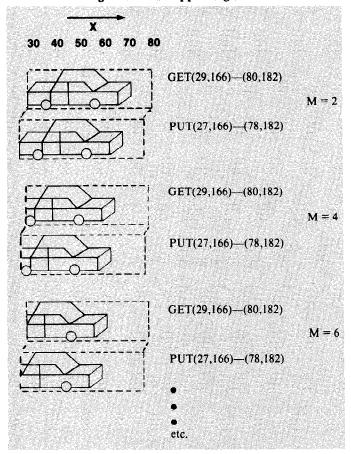
#### **QUASAR ANIMATIONS**

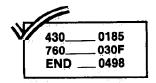
1520 Pacific Beach Drive, San Diego, California 92109 (619) 274-2202

The next GET statement then "loses" two positions from the front of the car as shown in Figure 4. This is done by the lines:

970 FOR M = 2 TO 40 STEP 2 980 GET(29,166)—(80,182),C,G 990 PUT(27,166)—(78,182),C,PSET 1000 NEXT M

Figure 4 — Disappearing Car





#### The listing:

99 REM-SET SCREEN AND VARIABLES
100 PMODE 3,1:PCLS
110 SCREEN 1,0
120 DIM C(22),E(22)
130 '
199 REM-DRAW PAINT SHOP
200 LINE(88,185)-(152,135),PSET,
B
210 '

299 REM-DRAW CAR 300 DRAW"BM208,170;R8E4R8F4R8G4L SNE4; H4L8G4L8NE4D4R4BR4NU4R8NU8; R8BR4R4NU4E4U4G4L24" 31Ø CIRCLE(21Ø,178),5:CIRCLE(23Ø **32**Ø 399 REM-GET CAR AND MOVE 400 GET(204,166)-(255,182),C,G 41Ø FOR X=2Ø4 TO 161 STEP-2 42Ø PUT(X-2,166)-(X+49,182),C,PS 43Ø NEXT X 440 499 REM-OPEN SHOP DOOR 500 FOR Y=185 TO 160 STEP-1 51Ø PSET(152,Y,1) 52Ø NEXT Y 53Ø ' 599 REM-MOVE INTO SHOP 600 GET(161,166)-(212,182),C,G 610 FOR X=161 TO 103 STEP-2 62Ø PUT(X-2,166)-(X+49,182),C,PS 63Ø NEXT X 64Ø ' 699 REM-CLOSE DOOR AND PAINT CAR 700 FOR Y=160 TO 185 71Ø PSET(152,Y,4) 72Ø NEXT Y 73Ø R=RND(3)+1 74Ø DATA 107,172,119,168,131,172 , 135, 174, 131, 176, 121, 176, 113, 176 , 103, 176, 107, 178, 127, 178 75Ø FOR N=1 TO 1Ø 760 READ A.B 765 IF N=9 THEN R=2 77Ø PAINT(A,B),R,4 78Ø FOR W=1 TO 5Ø:NEXT W 790 NEXT N 81Ø ' 899 REM-RAISE DOOR AND MOVE CAR 900 FOR Y=185 TO 160 STEP-1 91Ø PSET(88,Y,1) 92Ø NEXT Y 93Ø GET(1Ø1,166)-(152,182),C,G 94Ø FOR X=1Ø1 TO 31 STEP-2 950 PUT(X-2,166)-(X+49,182),C,PS ET 960 NEXT X 970 FOR M=2 TO 40 STEP 2 98Ø GET(29,166)-(8Ø,182),C,G 990 PUT(27,166)-(78,182),C,PSET 1000 NEXT M 1099 REM CLOSE DOOR AND RESTORE 1100 FOR Y = 160 TO 185111Ø PSET(88,Y,4) 1120 NEXT Y 113Ø RESTORE: GOTO 3ØØ



## Switchable Expansion Is Here

CoCo HAS A COMPANION!!
GOOD NEWS Switch over to more versatility with the new BT-2000 COMPANION. Save CoCo's connector with the best COMPANION it will ever have.

- Load 5 cartridges into the COMPANION and avoid the hassles while enjoying the benefits of push-button selection.
- Push a Button or select from your keyboard to turn on one of your 5 selections. Handy indicator lights let you know at a glance which cartridge is connected.
- No More Turn-Offs. Just switch to the next cartridge in your COMPANION. Push a button to Restart without turning off the
- Plug-in. Fill one to five slots for flexible programming, game playing or both. Choose ROM Packs, serial ports, parallel ports, or disk drives. Then do what you like to do best. The most powerful and cost effective expansion you will find for just \$249.95.

#### FOR THE ADVANCED USER OR EXPERIMENTER

- The utmost in expansion power and versatility is the BT-1000 Expansion Interface Unit. \$270.00.
- Large Built-in power supply to power your peripherals and experimenter circuits.



• Space for your ML utilities with optional 8K of RAM. \$300.00

ASIC Dept. Q P.O. Box 511 Ortonville, MI 48462 (313) 627-6146

#### ALSO NEW FROM BASIC TECHNOLOGY!!

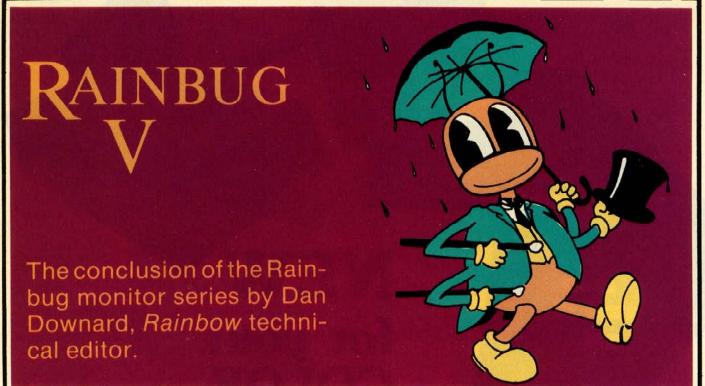
- BT-1010 PPI Parallel Printer Interface. Free-up CoCo's serial port. Run your printer at top speed. Five foot cable with Centronics compatible connector and machine language printer driver are included. \$79.95.
- BT-1020 Real Time Clock/Calendar. Let CoCo keep the time and date for your programs and files. Day-light savings time and leap year keep you on time. Save data or program memory even when power is off with 50 bytes of battery backed memory. Alarm capability to turn on the coffee pot. All for only \$109.00.
- BT-1030 VIP Versatile Interface Port. Connect CoCo to the outside world with two 8-bit parallel ports, two 16-bit timer/counters and a serial shift register. All user programmable. \$69.95.
- WRITE FOR FREE BROCHURE.

For years of trouble-free enjoyment all Basic Technology products use top quality components and are backed by a full 180 day parts and labor warranty. We service what we sell!!!

Add \$5 shipping & handling for BT-1000, \$2.50 for BT-1020. Michigan residents add 4% sales tax. Shipping & handling for residents of Canada, Hawaii, Alaska is \$10. Overseas orders add 15%. Check, money order, VISA, MC (give account no., expiration date, phone no.). Personal checks allow 2-3 weeks to clear. COD charge \$2 (requires certified check or money order).

> "Watch for more peripherals from Basic Technology."





or the final installment of RAINBUG, the machine language monitor for the CoCo, we will review all of the available commands in detail. A few are new this month such as G, C and B. These commands give you the ability to set breakpoints and jump to other program locations. All registers may be examined and changed using the R command. As you may know, the Motorola ASSIST-09 monitor was used as a guideline for RAINBUG, so if more information is necessary find a copy of M6809PM(AD)— MC6809 MC6809E Microprocessor Programming Manual. At the same time you will have to have a programmable timer to implement the trace, or single-step, function and that was outside the scope of this series. If anyone is successful interfacing a MC6840 programmable timer, let's hear from you.

#### **Command Format**

RAINBUG accepts three possible command formats depending on the operation. Examples are as follows:

R CR

M SPACE EXPRESSION CR

O SPACE EXPRESSION1 SPACE EXPRESSION2

Notice that expression is used instead of address. An expression can be a combination of addresses. Elementary operators such as "+" and "-" can be used. Leading zeros are unnecessary. There are four special characters:

M-current memory pointer

(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio (K4KWT). His interest in computers began about five years ago and he has built several 68XX systems.)

W-Window value set by W command

P—Current program counter

@—Indirect address

Examples:

M-WCurrent memory pointer minus window val-

P - 100 Current program counter minus \$100 100@ — Value of two bytes at address \$100

Hex address \$1234

As you can see, the expression analyzer is the key to the monitor and can be used to your advantage as you become familiar with it. Any non-hex input other than those noted above will abort a command. A space is used between all commands and expressions and all commands are terminated by a carriage return.

"That about does it for RAINBUG. It gives you all you need to know to do your own machine language programming."

B - Breakpoint

B CR

B SP - CR

B SP EXP CR

#### Commands

Add or delete up to eight break-

points

Prints all breakpoints Deletes all breakpoints

Adds a breakpoint at EXP

#### MONITORS

#### **BMC GREEN SCREEN 12"**

#### **COMREX CR 5600 HI-RES MONITORS**

12" Green Phosphor	179.95
12" Yellow Phosphor	189.95
12" Amber Phosphor	

#### COMREX CR 5500 **GREEN SCREEN**

12" Phosphor Monitor . . . . . . . 129.95

#### **VIDEO PLUS**

(From Computerware)

This unit is so good, we have stopped producing our popular video interface kit so that we can supply our customers with the best unit available. Requires no soldering or hole cutting for installation. Will work on ANY composite monitor, color or monochrome.

Only.....\$24.95

#### BMC-BM-AU919IU

(13" Color Monitor)

High resolution display monitor produces an incredibly sharp image. Includes builtin speaker with audio circuit. Compatible with virtually any microcomputer. .....\$344.95

#### **DUAL JOYSTICK UNIT** (D.J.)

Single unit assembly enhances playability of multi-joystick/player games; convenient press-to-fire buttons Add \$4.00 shipping . . . . . . . . . \$35.95

#### SPLC-1

Lower Case Board

(By Saturn Software)

Plug in board gives true lower case letters with descenders instead of inverted letters on your video display. Installation of an optional switch (not provided) allows inverse or standard video with the flip of a switch. Fits all "E" and later "D" boards. .....\$59.95

#### L CINT

Lower case interpreter program allows input of lower case command words to be accepted. Also allows for one key pause features and single step through listings. With instructions and cassette, disk com-

**U.S FUNDS ONLY** C.O.D. ORDERS ACCEPTED

Sorry, no CO.D. on printers and

NO CREDIT CARD ORDERS

#### **MEMORY** UPGRADE KITS

16K RAM CHIPS ..... 1.50 ea.

#### '16K/32K MEMORY UPGRADE KIT

Eight 200 NS 4116 Factory Prime Chips with Piggy Backed Sockets, Sam Socket, Bus Wire, and 32K Ram Sticker. Comprehensive Instructions. Recommended for "D" or earlier, but may be used on "E". Only 9 simple solder connections to kit. None to computer.

#### .....\$25.95 **'64K RAM CHIPS**

Eight 200 NS Factory Prime 64K RAM Chips. Allows you to upgrade "E" board easily. No soldering needed.

......\$69.95

NOTE: 64K upgrade will NOT provide 64K of user Ram, but allows later revision boards (E, ET) to run cooler and more efficiently.

*Installation of these items will void the Radio Shack warranty. Radio Shack is a trademark of the Tandy Corp.

#### NANOS COLOR BASIC AND EXTENDED SYSTEM REFERENCE CARD

"The New Industry Standard" \$4.95

(We pay postage on this one) All types of Nanos cards available

#### **PRINTERS**

#### **EPSON PRINTERS**

FX-80+	\$575.00
RX-80	\$449.00
Serial Interface w/4K	Buffer
Ideal for 80C use	\$109.95
80CTO Epson Cable	\$19.95
Constitution to Co	

#### See shipping Info

#### PRINTER ACCESSORIES

Roll F	aper Hole	der (E	pson).		30.00
Adjus	stable Trac	ctor fo	or FX-8		39.95
Also	Tractor	Fed	Mail	Labels	and
Casse	tte Labels	, Ribl	bons, e	tc.	

#### **COCO PRINTER PACKAGE**

Epson FX-80 and	Serial	Interface	with 4K
Buffer, Cable			. 674.90

#### COMREX CR-1

Compact desk-top daisy wheel printer, especially designed for word processing. Assures high reliability, and produces quiet, high quality printing. Complete with RS-232 interface.

.....\$810.00

#### JARB DISK DOUBLER

Why spend twice as much as you need to for double sided diskettes? With our doubler, you can make your own and pay for it with the first box you double. A must for disk drive users.

#### 51/4" size only ......12.95 **BASF DATA CASSETTES**

	C-05	C-10
1-10	.60 ea.	.65 ea.
11-20	.55 ea.	.60 ea.
Soft Poly C	ases	Ea. \$.20
	ed Cases	
Cassette La	abels (12)	Sh. \$.36
Cassette La	abels Tractor (1000	))\$30.00

Call or write for quantity prices on all cassette products. Special lengths available, eg., C-02, etc.

We carry products from many manufacturers. If you don't see it, ask.

SHIPPING AND HANDLING: Printers and monitors add 3%. Unless otherwise specified, all other orders \$2.00 per order. California Residents add 6% sales tax.

B SP - EXP CR	Deletes a break at EXP
C — Call	Call a user subroutine
C CR	Call routine at current program
	counter
C SP EXP CR	Call routine at address EXP
DR— Disk Read	Read track and sector after
	prompts at address \$2000
DW- Disk Write	Writes 256 bytes at \$2000 to track
	and sector as prompted
E — Encode	Encode a postbyte
E SP H , X CR	Return 5-bit offset from X
E SP HHHH,PCR CR	•
G - Go	Execute user program
G CR	Execute at current program count-
C CD EVD CD	er
G SP EXP CR	Execute at address EXP
L - Load tape	Same as CLOADM
M — Memory examine M SP EXP CR	
	Examine address EXP
нннн /	Examine address HHHH
1	Examine at address of last exam-
EXP	ine/change
SP or , or /	Replace byte with EXP Go to next address
LF	Print next address and byte value
UA	Print previous address and byte
	value
CR	Terminate command
' TEXT '	Enter ASCII TEXT
O — Offset	Compute branch offsets
O SP FROM SP	company oraniem orracto

### **About Your Subscription**

Your copy of the RAINBOW is sent second class mail and, for subscribers in the United States, the date of mailing is printed on the label. If you do not receive your copy by the 25th of any month, send us a card and we will mail another immediately via first class mail.

You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an "account number" and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at P.O. Box 209, Prospect, KY 40059. This applies to everyone except those whose subscriptions are through our distributor in Australia.

TO CR	Computes one or two byte offset FROM-TO
R — Register	Examine/change registers
R CR	Examine registers
SP	Skip to next register
EX P SP	Change and advance to next register
CR	Terminate command
P — Punch	Same as CSAVEM command
P SP xxxx	Save machine language
SP yyyy	program. xxxx-start
SP zzzz	yyyy-end zzzz-execute
SP file CR	file—BASIC filename
V — Verify	Same as BASIC SKIPF
@ — Printer	Toggles printer port

#### Summary

That about does it for RAINBUG. It gives you all you need to know to do your own machine language programming. Be extremely careful using the disk commands. All input has to be in HEX. Rather than type in the listing I would suggest you obtain a copy of Rainbow On Tape as it will have the entire program and save you hours debugging. The program is position independent and can be relocated anywhere in memory. At present it is located at \$3000. Addresses immediately below \$3000, or wherever you wish to locate the program, are used for the stack. Try to avoid this area. Good luck and happy programming.

						ŭ
			99199	*RAINB	JG	
			99119	*DAN D	DWNARD	REV 4
			99111	*LINES	100-2100	AND LINES
			00112	*2885~·	4876 APPE	ARED IN PARTS
			66113	*1 THR	J 4 OF TH	IS SERIES
3000						\$3000
				*COLD S		
		8C FD			LEAX	RESET, PCR
31A1		9 D	<b>9</b> 216 <b>9</b>		STX	\$9D
31A3	20	12	92179		BRA	MONTR1
					MESSAGE	
31A5		3F#4	92189	ERRMSG	FDB	\$3F <b>9</b> 4
31A7	30	8C FB	Ø219Ø	ERROR	LEAX	ERRNSG, PCR
31AA	8D	E2	92299			PDATA1
31AC	16	9419				CMD
			Ø2215	*MONIT(	OR PROMPT	
31AF		52	02220	SIGNON	FCC	/RAINBUG/
3186		Ø4	Ø223 <b>Ø</b>		FCB	<b>\$</b> Ø4
			Ø2235	*SETUP	SOFTWARE	INTERRUPT
3187	8E	358B	<b>02240</b>	MONTR1	LDX	#SWI
31BA	BF	9197	Ø225Ø		STX	\$107
31BD	86	7E	92269		LDA	#\$7E
31BF	87	0106	Ø227Ø		STA	\$196
			Ø2275	*SETUP	STACK AND	D START
31C2	32	8D FEØF	Ø228Ø		LEAS	-22+STACK,PCR
3106	Cá	16	Ø2285		LDB	#\$16
3108				MONTR2		
	1F		92399		TFR	A, DP
	8D	<b>9</b> 2	92319		BSR	MONTR
	29	F9	Ø232Ø		BRA	MONTR2
				MONTR	STS	RSTACK
	30		Ø236Ø		LEAX	SIGNON, PCR
	8D		Ø237 <b>Ø</b>		BSR	PDATA
3108	16	Ø3E4	92389		LBRA	CMD

31DB		92385	RMB	25	322A		73C2	<b>9</b> 2849		FDB	VER-+
			LE OF COMM	·	322C		64	<b>9</b> 2845		FCB	4
	31F4	92569 CMD1	and the second second	· #	322D		57	#285#		FCC	/\/
31F4	94	Ø2565	FCB	4	322E		FE5E	<b>9</b> 2869		FDB	CWINDO-*
31F5	42	92579	FCC	/B/	323 <b>9</b>		94	<b>92865</b>		FCB	4
31F6	9211	Ø258Ø	FDB	BKPT-*	3231		58	92879		FCC	/ <b>X</b> /
31F8	94	92585	FCB	4	<b>32</b> 32		992B	<b>9</b> 288 <b>9</b>		FDB	EXIT-#
31F9	43	Ø259Ø	FCC	/0/	3234		FE	Ø2882		FCB	-2
31FA	Ø2AF	<b>82688</b>	FDB	CALL-*			. 9	Ø4875	*SET/F	RESET BR	EAKPOINTS
31FC	94	<i>0</i> 26 <i>0</i> 5	FCB	4	3497		25	94889	BKPT	BEO	BKDSP
31FD	44	92619	FCC	/0/	3499	17	FC89	Ø489Ø		LBSR	BLDNUM
31FE	Ø18A	92629	FDB	DISK-*	34ØC	27	30	94999		BEQ	BKADD
3200	<b>9</b> 4	<b>9</b> 2625	FCB	4	34 <b>9</b> E	81	2D	94919		CMPA	#\$2D
3261	45	Ø263Ø	FCC	/E/	3410	26	43	94929		BNE	BKERR
3292	9961	<b>9</b> 264 <b>9</b>	FDB	ENCDE-*	3412	17	FC8Ø	94939		LBSR	BLDNUM
3284	<b>94</b>	Ø2645	FĆB	4	3415	27	94	64946		BEQ	BKDLE
3295	47	<b>6</b> 265 <b>6</b>	FCC	/6/	3417	7F	3561	94950		CLR	BKPTCT
3206	9266	<b>9</b> 266 <b>9</b>	FDB	60-*	341A	39		94969	BKRTS	RTS	
3298	94	92665	FCB	4:	341B	8D	44	94979	BKDLE	BSR	BKSET
3209	4C	9267 <b>9</b>	FCC	/L/	341D	5A		94989	BKDLP	DECB	
32 <b>9</b> A	72F4	Ø268Ø	FDB	LOAD-*	341E	2B	35	94999		BMI	BKERR
32ØC	<b>6</b> 4	<b>9</b> 2685	FCB	4 .	3420	ΑC	Ai	95999		CMPX	, Y++
32 <b>9</b> D	40	92699	FCC	/M/	3422	26	F9	95919		BNE	BKDLP
32ØE	FDF2	Ø27 <b>Ø</b> Ø	FDB	CMEM-*	3424	ΑE	A1	05020	BKDLM	LDX	, Y++
3210	94	<b>#27#5</b>	FCB	4	3426	AF	3C	95939		STX	-4,Y
3211	49	Ø271Ø	FCC	/8/	3428	5A		95949		DECB	
3212	ØØEE	<b>0</b> 272 <b>0</b>	FDB	PRINT-*	3429	2A	F9	95959		BPL	BKDLM
3214	Ø4	Ø2725	FC8	4	342B	7A	3561	95969		DEC	BKPTCT
3215	4F	Ø273Ø	FCC	/0/	342E	80	31	05070	BKDSP	BSR	BKSET
3216	991F	<b>9</b> 274 <b>9</b>	FDB	OFFS-*	3439	27	E8	95989		BEQ	BKRTS
3218	<b>9</b> 4	<b>9</b> 2745	FCB	4	3432	30	AI	05090	BKDSL	LEAX	, Y++
3219	5∅	Ø275Ø	FCC	/P/	3434	17	FD2F	Ø51ØØ		LBSR	OUTAHS
321A	99F4	<b>9</b> 2769	FDB	PUNCH-*	3437	5A		05110		DECB	
321C	94	Ø2765	FCB	4	3438	26	F8	Ø512Ø		BNE	BKDSL
321D	52	92779	FCC	/R/	3 <b>4</b> 3A	17	FD46	Ø513Ø		LBSR	PERLF
321E	9296	Ø278Ø	FDB	RE6-*	343D	39		Ø514Ø		RTS	
3229	Ø4	Ø2785	FCB	4	343E	8D	21	95159	BKADD	BSR	BKSET
3221	53	Ø279Ø	FCC	/\$/	3440			95169		CMPB	#8
3222	Ø33Ø	92899	FDB	STLEV-*	3442	27	11	05170		BEQ	BKERR
3224	Ø4	Ø28Ø5	FCB	4	3444			Ø518Ø		LDA	,χ
3225	54	Ø281Ø	FCC	/T/	3446			Ø519Ø		STB	, X
3226	Ø437	Ø282Ø	FDB	TRACE-*	3448			05200		CMPB	, X
3228	<b>Ø</b> 4	92825	FCB	4	344A			95219		BNE	BKERR
3229	56	02830	FCC	/٧/	344C			05220		STA	, X

	16K EXT. COLOR BAS	BIC & M	ATH WORKSHEET-Q	JIZ MAKER
	PRINTER REQUIRED		WHOLE NUMBERS	<b>\$6.75</b>
			FRACTIONS	<b>\$6.95</b>
	WORD SEARCH PUZZLE	E MAKER	DECIMALS	\$4.95
(HITTERS)	STANDARD	\$6.95	PERCENTS	\$6.95
	DEFINITIONS	\$6.95	LENGTH	\$6.95
Shamrock	WIDE	\$6.95	AREA	<b>\$6.95</b>
	BIG LETTERS	\$6.95	VOLUME	<b>\$6.95</b>
<b>Dottwar</b>	C SEQUENCE DRILL	\$6.95	CAPACITY	\$6.95
1382 NORTON ROAD			WEIGHT	\$6.95
RADNOR OHIO 43066	OHIO RES. ADD 5.5% SALES TAX		TIME	\$6.95
614-494-2277			SPEED	\$6.95
	ANY 3 10% OFF ANY 5 15% OFF	ANY 8 20% OFF	ANY 10 25% DFF	

344E	5A		95239	BKADL	DECB		34CØ	9	<b>B</b> A	95799		FCB	19
344F	28	<b>Ø</b> 7	95249		BMI	BKADT	3401	4	12	Ø58ØØ		FCC	/B/
3451		Al	<b>95259</b>		CMPX	, Y++	3402		30	Ø581Ø			Ø
3453		F9	95269			BKADL	34C3		)B	Ø582Ø			11
3455		Ø1C6	<b>95279</b>	BKERR		CMDBAD	3404		58	Ø583Ø			/X/
3458		A4	Ø528Ø			,γ	34C5		F	Ø584Ø			-i
345A		31	Ø529Ø		CLR	-8*2+1,Y	3406		D	95859			13
345C		3561	95399			BKPTCT	3407		59	95869			/Y/
345F		CD	Ø531Ø			BKDSP	34C8		FF	Ø587Ø			-1
3461		3199	95329	DVCCT		NUMBER	3409		)F	95889			15
		3177 BD ØØFA					34CA			95899			
3464				BKLDR		BKPTBL, PCR			55				/0/
3468		3561	Ø534Ø			BKPTCT	34CB		F	95999			-1
3468	24		Ø535Ø		RTS		3400		11	95919			17
				*GOTO PE			34CD		3	05920			/5/
346C		Ø1	95369	90	BSR	GOADDR	34CE		FF	95939			-i
346E	38		Ø537Ø		RTI		34CF		31	05940			1:
					ADDRESS (		34DØ		43	95959			/C/
346F		30		GOADDR	PULS	Υ, Χ	34D1		13	Ø596Ø			/0/
3471		10	95399		PSHS	X	34D2		99	05979			Ø
3473		1A	95499		BNE	GONDFT	34D3		79	05980			9
3475	8D	ED	<b>05410</b>		BSR	BKLDR	34D4	4	44	Ø599Ø		FCC	/0/
3477	AE	E4	Ø542Ø		LDX	,9	34D5		59	96999		FCC	/P/
3479	5A		05430	ARMBLP	DECB		34D6		00	06010		FCB	Ø
347A	28	18	95449		BMI	ARMBK2	34D7	(	<b>3</b> C	06020		FCB	12
347C	A6	39	05450		LDA	-8*2,Y	34D8	1	99	Ø6939		FCB	ø
347E	AC	A1	95469		CMPX	, Y++				96935	*PRINT R	EGISTERS	
3489	26	<b>F</b> 7	05470		BNE	ARMBLP	34D9 4	F				CLRA	
3482		3F	95489		CMPA	#\$3F	34DA 3		E8 1Ø				4+12,5
3484		93	95499		BNE	ARMNSW	34DD 3		32	06060			Y, X, A
3486		3582	05500		STA	SWIBFL	34DF 3		BC D8	96979			REGMSK, PCR
3489		3584		ARMNSW	INC	MISFLO	34E2 E		AØ	96989		LDD	, Y+
348C		Ø1D4	Ø552Ø		LBRA	DOT	34E4 4			96999		TSTA	***
348F		FCAD		GONDET	LBSR	CDNUM	34E5 2		<b>9</b> 5	96199			REGP2
3492		E4	95549	pulle, ,	STD	,S	34E7 1		FC9Ø	96119			OUTCH
3494		FFCD		ARMBK2	LBSR	BKLDR	34EA 2		F6	96129		BRA	REGP1
3497		3561	95569	HHIDNE	NEG	BKPTCT	34EC 8		20	96139	פפפס		#\$2D
349A		0001		ARMLOP	DECB	DM 101	34EE 1		FC89	Ø614Ø			OUTCH
	1028	EE78	Ø558Ø		LBMI	BKRTS						LBSR	
349F		B4:	Ø559Ø		LDA		34F1 3		E5 = 4	06150		LEAX	8,5
		30			STA	[, Y]	34F3 6		E4	06160		TST	,5
34A1			Ø56ØØ			-8*2,Y	34F5 2		16	96179		BNE	REGCNG
34A3		3F	95619		LDA	#\$3F	34F7 6		3F	96189		TST	-1,Y
34A5		B1	Ø562Ø		STA	[,Y++]	34F9 2		05 50:0	96199			REGP3
34A7	29	F1	95639		BRA	ARMLOP	34FB 1		FC68	06299		LBSR	OUT 4HS
7445					UBROUTIN		34FE 2		03	96219			REG4
34A9		C4	05640		BSR	GOADDR	3599 1		FC65	06220		LBSR	OUT2HS
34AB		7F	95659		PULS	U,Y,X,DP,D,CC	3503 E		AØ	Ø623Ø	REG4	LDD	,Ÿ+
34AD		F1	05660		JSR	[,5++]	3505 5			96249		TSTB	
34AF		0104		GOBRK	LBSR	BKPNT	3506 2		DA	96259		BNE	REGP1
34B2	29	FB	95689		BRA	GOBRK	35 <b>0</b> 8 1		FC78	96269		LBSR	PCRLF
	-					REGISTERS	350B 3	55	92			PULS	PC,Y,X,A
3 <b>4B4</b>		23	Ø569Ø		BSR	REGPRT						REGISTER	
3486			<b>95799</b>		INCA		350D 1		FB83		REGCNG	LBSR	BLDNNB
34B7		21	95719		BSR	REGCHG	3510 2		11	Ø629Ø		BEQ	REGNXC
3489			Ø572Ø		RTS		3512 8	31	ØD	96399		CMPA	#\$ØD
34BA		59	95739	REGMSK	FCC	/P/	3514 2		20	96319		BEQ	REGAGN
34BB		43	95749		FCC	/¢/	3516 E	6	3F	96329	•	LDB	-1,Y
34BC		FF	05750		FCB	-i	3518 5	δA		Ø633Ø		DECB	*
34BD		13	05760		FCB	19	3519 5			96349		NEGB	
34BE		41	95779		FCC	/A/	351A 5			96359		ASLB	
34BF		99	Ø578Ø		FCB	Ø	351B 1		FC4C		REGSKP	LBSR	SPACE

#### Sale — Sale — Sale



LARGE CHARACTERS FOR SMALL CHILDREN OR THE VISUALLY IMPAIRED

123456789012345678901

ABCDEFGHIFKLMMOPQRSTU VWXYZabodef9hijklmnop anstuvwxYz**e** 



#### SOLUTION ON CARTRIDGE

The cartridge version of THE SOLUTION has all of the features of the tape version and more. It works with all of the graphic modes (including 4 colors). It includes a 51 characters per line feature and the ability to define a text window on the screen. All of this and much more at the low price of -\$34.95

ROM-PAKS \$9.95
This is an empty Rom-Pak with a PC board. It will hold either a 2716, 2732 or a 2764. The case looks very similar to Radio Shack's Rom-Pak. Comes complete with

instructions.
CUSTOM PROGRAMING

We will put your program in a Rom-Pak for you for a very reasonable fee. The program can be either Basic or machine language. Prices start at \$19.95 for programs up to 4K in length. \$29.95 for programs up to 8K. Volume discounts are available. Send for a free submittal form.



#### SCRIPTFX \$9.95 \$ 4.95

Are you tired of the upper case display of Color Scripsit? Well then **SCRIPTFX** is for you. This is a program which converts the display of Color Scripsit over to a real display of upper and lower case letters with descenders. The program allows all of the features of Scripsit to function and comes with a money back guarantee if it does not work. Please specify machine type when ordering. Extended Basic is not required.

#### SUPER PILOT \$9:95 \$ 7.95

An enhanced version of Pilot for use with Extended Basic. Includes features for math, graphics, and sound. Has a feature that makes it easy to create flash card type drill programs. Programs are pseudo compiled for faster execution. Comes with as 24 page tutorial manual and demo programs. Sample program included on tape to get you

All programs for 16K, 32K Extended Basic machines unless otherwise noted. All programs on cassette. Add \$4.00 per order for disk

DISCOUNT — order 10 or more programs (you may mix types) and you will receive a 30% discount on the order. Dealer discounts are also available.

## SNAKE MOUNTAIN SOFTWARE P.O. BOX 5722 RALEIGH, NC 27650 919-828-6669

24 hour phone COD ordering service.

## Congratulations

you made the right choice when you purchased a Color Computer. It is a very powerful machine.

However the standard display format does not do the machine justice. The machine is capable of much more than 16 lines of 32 all capital characters. Now you can give your Color Computer the display it deserves. **THE SOLUTION** gives the Color Computer a much better display than it normally has, and really makes the machine shine. Its features include:

- provides a screen of 42 characters by 21 lines displayed
   linked directly to basic program is transparent to the
- prints all 96 ASCII characters, lowercase characters have descenders, has a slashed **zero** to avoid confusion when programing prints characters on any two-color graphic screen
- graphics and text may be intermixed on the same screen graphics and text may be merringed on the same screen special mode with 4 lines of text at the bottom of the screen (just like some other famous color machines) — great for working with graphics large character mode for small children or the visually
- impaired
- character set may be reversed
- written in machine language, program is relocatable fast prints at over 600 characters per second works with both cassette and disk

- includes a 20 page manual with demo programs (a lunar lander program is included)

SOLUTION \$19:95 \$14.95

#### EXTENDER \$ 7.95 \$ 4.95

Still want more than 42 characters per line from your computer. Then the **EXTENDER** is for you. This program when used with **THE SOLUTION** will give a display of **51** characters per line by 21 lines displayed. Please include your program serial number when ordering.

#### \$ 5.95 GRAPH LABEL \$8:95

Have you ever wanted to place characters on a graphic screen but couldn't find an easy way to do it. Well then **GRAPH LABEL** is for you. This program will enable you to place characters anywhere on a graphic screen. It will place any of 96 ASCII characters on the screen or you may create your own characters. It features a cursor that may be moved anywhere around the screen with out rubbing out what it goes over. Superscripts and subscripts may be used since the cursor may be moved vertically and horizontally in steps as small as one pixel. Lowercase characters have descenders. GRAPH LABEL is written in Basic and is therefore easy to modify. It may be used by itself or as a subroutine.

#### SCREEN PRINT PACKAGE \$8:95 \$ 5.95

A package of 2 programs for use with the LPVII, LPVIII, DMP100, DMP200, DMP400, DMP500. The programs will print an image of what is on a graphic screen to the printer. Both programs work with all the standard PMODEs. The programs are written in machine language and may be moved anywhere in memory. The two programs are:

- 1) **SCREEN PRINT** will produce a regular size print. The image may be located anywhere on a page.
- 2) DOUBLE SIZE SCREEN PRINT this program will produce a full size image that will fill up a sheet of paper. The finished product is 8 by 6.5 inches in size. Your computer graphics look really good when they are printed out with this program.

SHIPPING — add \$2.00 for orders less than \$20.00. Shipping is free on orders of more than \$20.00. Canadians - please send money orders only.

All orders shipped within 5 working days.

					2562	
351E			96379		DECB	DE BRUS
351F		FA	06380		BNE	REGSKP
3521		EØ	96399		BRA	REG4
3523		E4	96499 I	REGNXC	STA	, S
3525		3199	96419		LDD	NUMBER
3528		3F	96429		TST	-1,Y
352A	26	02	06430		BNE	REGTWO
352C	A6	82	96449		LDA	,-X
352E	ED	84	06450	REGTWO	STD	, X
353∌	A6	E4	96469		LDA	,5
3532	81	ØD	96479		CMPA	#\$ØD
3534	26	CD	Ø648Ø		BNE	REG4
3536	30	8D FAB1	96499	REGAGN	LEAX	TSTACK, PCR
353A	63	15	96599		LDB	#21
353C	35	92	96519	REGTF1	PULS	A
353E	A7	89	06520		STA	, X+
3540	5A		Ø653Ø		DECB	
3541	26	F9	96549		BNE	REGTF1
3543	1ØEE	88 EC	96559		LDS	-20, X
3547	C6	15	Ø656Ø		LDB	#21
3549	A6	82	96579	REGTF2	LDA	, -X
354B	34	<b>9</b> 2	Ø658Ø		PSHS	A
354D	5A		96599		DECB	
354E	26	F9	Ø66ØØ		BNE	REGTF2
355Ø	20	<b>B9</b>	Ø661Ø		BRA	REGRTN
				*SET TR	ACE LEVE	L
3552	27	<b>Ø</b> 7	96629	STLEV	BEQ	STLDFT
3554	17	FBE8	96639		LBSR	CDNUM

<b>20 320 320 320 320 320 320</b>	0 <b>45</b> 0
<b>93</b> 9	
Now a <i>LOGO</i> for the <i>COLOR COMPUTER</i>	
	<b>32</b> 0
TINY TURTLE	<b>#</b> 0
TINY TURTLE is an affordable, fully compatible LOGO language with high resoultion turtle graphics, music, fast processor operation, and retrieval of user procedures. TINY TURTLE comes complete with spft copy reference user manual.	
manual. ≇©	<b>#</b>
32K/EXTD BASIC CASSETTE or DISK \$39.95 HARD-COPY MANUAL \$4.95	
ALSO	
GAS MILEAGE MONITOR DISK \$9.95	
SDS COMPUTERS BOGOTA,NJ POB 450 07603 NJ ADD 5% TAX	
- S##\$©	# <b>#</b> #
480 480 480 480 480 480 480 480 480 480	o mo

3557	FD	3585	96649		STD	SLEVEL
355A	39		Ø665Ø		RTS	
3558	39	6E	96669	STLDFT	LEAX	14,5
355D	BF	3585	96679		STX	SLEVEL
3560			96689		RTS	
			· /	*VARIABL		
3561		99		BKPTCT	FCB	Ø
3562		עע			RMB	16
3572				BKPTOP	RMB	16
3582				SWIBFL	RMB	1
3583			· ,	SWIENT		1
3584			96739	MISFLG	RMB	1
		2FEB		TSTACK	EQU	-21+CMEM
3585			96759	SLEVEL	RMB	2
3587			96769	TRACEC	RMB	2
3589			96779	LASTOP	RMB	2
			96772	*SOFTWA	RE INTERI	RUPT ROUTINE
3588	6A	8C F5	Ø6775	SWI	DEC	SWICHT, PCR
358E	17	99E5	96785		LBSR	LDDP
3591	EΕ	6A	Ø679Ø		LDU	10,5
3593		5F	94899		LEAU	-1,0
3595		3582	96819		TST	SWIBFL
3598		19	Ø682Ø		BNE	
		1.5				SWIDNE
359A		FEC7	Ø683Ø		LBSR	BKLDR
359D			96849	#1101 B	NEGB	
359E			Ø685Ø	SWILP	DECB	
359F		99	94849		BMI	SWIDNE
	11A3		96879		CMPU	, Y++
35A4	26	F8	06880		BNE	SWILP
35A6	EF	6A	96899		STU	10,5
35A8	20	ØC	96999		BRA	BKPNT
35AA	7 <b>F</b>	3582	-96919	SWIDNE	CLR	SWIBFL
35AD		62	96911		LEAS	2,5
35AF		8D FBF2		ERROR1	LEAX	ERRMSG, PCR
35B3		FBDØ	Ø6913		LBSR	PDATA
3586		0002		BKPNT	LBSR	REGPRS
35B9		Ø7	06930	P111,111	BRA	CHDNEP
35BB		FF1B		REGPRS	LBSR	REGPRT
35BE		1110	Ø6932	NEOL NO	RTS	NEOL W.
JUDE	3,7			*COMMAN	7.4	n
7EDE	. 7	rns:			D HANDLE	
35BF		FBC1	96949		LBSR	PCRLF
35C2	,	FE9F		CMDNEP	LBSR	BKLDR
3505		ØD	96969		BPL	CMDNOL
3507		•	96979		NEGB	*
35C8		3561	06980		STB	BKPTCT
35CB	5A		Ø699Ø	CMDDDL	DECB	
35CC	2B	96	97999		BMI	CMDNOL
35CE	A6	39	07010		LDA	-8*2,Y
35DØ	A7	Bi	97929		STA	[,Y++]
3502		F7	97939		BRA	CHDDDL
35D4	•	6A	97949		LDX	10,5
35D6		3195	07050		STX	PCNTER
35D9		23	97969		LDA	<b>#\$23</b>
35DB		FB9C	97979			DUTCH
					LBSR	
35DE		E4	97989		LEAU	,5
35EØ		3261	Ø7Ø9Ø		STU	PSTACK
35E3			97199		CLRA	
35E4			07110		CLRB	
35E5	Εħ	3199	97120		STD	NUMBER
35E8		3584	Ø713Ø		STD	MISFLG

35EB C6		<b>97149</b>	LD		
35ED 34		97159	PS	T	
35EF 17		97169		SR READ	
	8D FA6D			AX 2+CMPADP,PCR	
35F6 81		Ø718Ø		PA #\$2F	
35F8 27		Ø719Ø			
35FA 81		<i>8</i> 72 <i>98</i> C		PA #\$2Ø	
35FC 23		Ø721Ø	BL	S CMDGOT	
35FE 34		97229		hs a	
36 <b>00</b> 60		<i>9</i> 723 <i>9</i>	IN	C -1,U	
3692 81		<b>9</b> 7249	CM	PA #\$2F	
3694 27		<b>9</b> 725 <b>9</b>	BE	Q CMDMEM	
3696 17		97269	LB		
3609 27		Ø727 <b>Ø</b>	BE		
360B 6A		<b>9</b> 728 <b>9</b>	DE	•	
360D 17		Ø729Ø CI		SR READ	
3619 29		97399		A CMD2	
3612 80	ØD	97319 C		BA #\$ØD	
3614 A7		<b>0</b> 7320			
3616 39					
361A E6		<b>9</b> 7349 C	1DSCH LDI	В , Х+	
361C 2A		Ø735Ø			
361E 10FE		97369 CI	IDBAD LD	S PSTACK	
3622 16	FB82	<b>9</b> 737 <b>9</b>			
3625 5A			IDSME DE	CB	
3626 E1	5F	Ø739Ø	CMF	PB -1,U	
	<b>9</b> 3	97 <b>499</b>	BHS	S CMDSIZ	
362A 3A		97419 Ch	IDFLS AB)	(	
362B 2Ø	ED	97429			
362D 31	5D	07430 CM	IDSIZ LEA	Y -3,U	
	5F	97449	LD/	4 -1,U	
	<b>Ø</b> 2	<i>9</i> 745 <i>9</i>	SUE	A #2	
3633 A7	SE	97469	STA	₹ -2,U	
3635 <b>5</b> A		07470 CM	IDCMP DEC	<b>2B</b>	
3636 A6	89	97489	LD/	*	
3638 A1	A2	Ø749Ø	CMF	Α ,-Υ	
363A 26	EE	97599	BNE	CMDFLS	
363C 6A	5E	Ø751Ø	DEC		
363E 26	F5	9752Ø	BNE		
364Ø 3A		Ø753Ø	ABX		
3641 EC	1 <b>E</b>	97549	LDD	•	
3643 30	88	07550	LEA	. ,	
3645 6D	5D	97569 CM		,	
3647 32	C4	Ø757Ø	LEA	•	
3649 AD	1E	97589	JSR	•	
3648 16	FF86	Ø759Ø	LBR	· · · · · <del>-</del>	
364E 6D	5E	97699 CM		•	
3650 2B	00	07610	BMI		
	89 FFA2			X CMEMN-CMPADP,	X
3656 FC	3199	<b>0</b> 7630	LDD		
3659 20	EA	97649	BRA		
7/25	2FEB	97659 ST			
365B			TACK RMB		
7/ED 47	FARE		RACE FUNC		
365D 17	FADF	97679 TR			
3660 FD	3587	97689	STD		
3663 32	62	07690 DO		•	
3665 EE	F8 ØA	07700 TR		*	
3668 FF	3589	<b>9</b> 771 <b>9</b>	STU		
366B FE	3685	97729	LDU	PTM	

366E	CC	8761	67739		LDD	#\$9751
3671	ED	C9 3685	\$7748		STD	PTM,U
3675	2B		97759		RTI	
			97755	*CLEAR	UP STAC	K .
3676	5F		97769	LDDP	CLRB	
3677	1F	9B	97779		TFR	B, DP
3679	A1	63	97789		CMPA	3,5
367B	27	<b>9</b> 7	Ø779 <b>Ø</b>		BEQ	RTS
367D	19FE	365B	97899		LDS	RSTACK
3681	16	FF2B	97819		LBRA	ERROR1
3684	39		97829	RTS	RTS	
			Ø7825	*DUMMY	TIMER A	DDRESS
		3685	Ø783Ø	PTM	EQU	+
		3996	97849		END	CHEN
99996	TOTA	L ERRORS				

Hint . . .

### **Print Out Disk Directory**

If you have a long disk directory and want to see all of it, or if you simply wish to have a hard-copy printout of your directory, one simple command will allow you to do this easily.

Just POKE 111,254:DIR and the entire disk directory will appear on your printer, even if it is too long to be fully displayed on your screen.

#### **NEW FOR THE COLOR COMPUTER**

### GRAFPLOT

#### HIGH RESOLUTION DATA GRAPHING

GRAFPLOT turns your COLOR COMPUTER into a sophisticated data plotter, producing professional quality graphs of any type of X-Y data. GRAFPLOT is perfect for personal, business, statistical, scientific and engineering applications. Includes features not found in any other COLOR COMPUTER graphing system:

- 222x174 pixel on-screen data plotting area.
   Complete on-screen labeling for two Y-axes w/200 data points per axis leven more points by chaining data files!.
   graphing options: 3 symbols w/2 line types or points only.
   Full function data editing: add, change, delete and sort.
   Hardcopy w/standard screenprint programs (not supplied)-includes interface for Tandy SCRPRT w/instructions for interfacing other printers and screenprint programs.
   Unlimited overlays-plot 9 or more data sets per graph.
   Graphs output to screen, printer, tape or disk.
   Plots any user-defined function, edit 4 program lines.
   Built-in data smoothing Imoving binomial averagel.
   Built-in integration -calculate areas or evaluate integrals of user-defined functions.

- user-defined functions
- Lists data and integrals to screen or printer
- Saves completed graphs for instant reloading.
   Manu-driven w/auto-prompt option for fast throughput.
   Complete error trapping-GRAFPLOT won't let you make a mistake, practically impossible to crash.
   Comprehensive manual w/tutorlals and sample data.

GRAFPLOT is available for 16K E.C.B. on cassette (\$35) and 32K-1 disk (\$45). Easy upgrade to disk for difference in price Idlsk version reads and writes tape data files). Send check or money order to: HAWKES RESEARCH SERVICES, 1442 SIXth St., Berkeley, CA, 94710. Include \$3 S/H on all orders. Manual available separately for \$10+S/H, refundable with purchase of GRAFPLOT. CA residents add state sales tax. Dealer inquiries welcome. Quantity discounts available.

313

## Save Storage By Packing Your Data

By B. H. Alsop

ven with a 32K CoCo, BASIC program storage space often becomes tight. Every array item, e.g. A(10), uses five bytes of memory. That's pretty expensive. One can conserve this valuable resource by packing multiple data items in one array. Here's how.

Concept

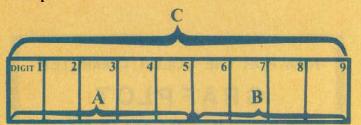


FIGURE 1. PACKING

"C" is the variable in which two other variables (A and B) are stored. In this case, "A" can be up to five digits long and "B" can be up to four digits long. C can't exceed nine digits for a CoCo. Variables A and B can represent integers or floating point numbers.

Sample Program

Listing 1 shows a sample program illustrating packing and unpacking data. Variables A and B each have 1000 items. Normally, one would dimension A and B to 1000 each. This would reserve 10K of memory for these two variables. Here a single variable (C) is dimensioned to 1000. Lines 40 and 50 do the testing to assure that A and B are within range. Line 60 is necessary to move B behind the decimal. Note that a value slightly larger than 0.001 is used to avoid round-off errors. If a value of exactly 0.001 is used, the unpacked value of B can be one too small. Line 70 does the packing. Line 90 unpacks A and line 120 unpacks B. RUN the program and you'll see that the input and packed/ unpacked values are equal. I had 17508 bytes of memory left when this problem was run.

(Brian Alsop is a Westinghouse engineer, holds amateur and commerical radio licenses and a pilot's license. He has used computers for 15 years to solve large numerical problems.)

Listing 2 shows a similar program where A and B are each dimensioned to 1000. Data is read into each of them. Here the memory remaining is 12644. The net savings in memory is about 5000.

#### Caveats

One doesn't get something for nothing. If you don't check the input numbers to be within range, you'll get garbage out. It is possible for A to be positive or negative in this packing/ unpacking process. The B can only be positive. The reason A can be negative is that INT(-12.7)=-13 and INT(12.7)=12. This is a curiosity I ran into when writing my packing subroutine. I really expected that INT(-12.7)=-12! It appears that the programmers of the INT function defined it with this application in mind.

#### Extensions

If the range of several variables, say A, B and C, are suitably restricted, there is no reason why three variables can't be packed in one variable. Remember, only one can be plus or minus and it must go before the decimal. The sum of the maximum significant figures can't exceed nine.

If you want to pack floating point numbers, first make them into integers by multiplying by a known power of 10. Truncate with an INT function call, and pack. After unpacking, divide by the same power of 10.

#### Origin

It seems that in the old days the "big computers" had storage limitations, too. A 16K machine was large back then. Thus, the idea of packing came into being. Where I work, there is a Cray-1 computer which has a 140K fast memory and 3.0 million slower core memory. It generates so much data in a few minutes of running that it can't all be stored on a single three million word tape. Packing is used to conserve tape storage.

It appears that available data to store will always exceed the ability to store it.

#### Listing 1

10 DIM C(1000) 20 FOR I=1 TO 1000

## B5 Software B5 believes the Computer is a unique teaching tool and deserves quality software. Our programs are based on sound learning principles and make learning fun.

## EDUCATIONAL PROGRAMS TRS-80 COLOR COMPUTER* & TDP-100*

with Extended Basic

CLOCK T

Grades 1-4. Helps children practice telling time. 4 skill levels: hour, quarter hour, 5 minute and 1 minute intervals. Options include reading hours and minutes separately on the large graphic clack with synchronized hands. After 10 correct answers a small mause ascends to the tune of Hickory, Dickory, Dock. 16K Cass \$24.95 32K Disk \$26.95

#### MONEY T

Grade 2-4. Prevides an opportunity to count coins. 5 skill levels range from counting only dimes, nickels and pennies to counting various combinations of all coins which can total mare than one dollar. The program uses graphic coins. If a series of 3 problems are answered correctly a rocket ascends to the moon. If 1 or more are incorrect, the rocket crashes instead. 16K Cass \$19.95 16K Disk \$21.95

#### BORROW T

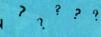
Grades 2-4. Allows the student to reinforce subtrac-Grades 2-4. Allows the student to relitate solution skills. Problems appear in large graphic numerals. Small baxes above the numerals allow for regrouping procedures. 7 skill levels. A happy face appears on the screen for each correct answer. After 10 completed problems, a Pac-Man-type creature munches a

numeral down. 16K Cass \$19.95 32K Disk \$21.95

#### CARRY T

Grades 2-4. A program designed to help students to practice addition. Uses same format as Borrow. 4 skill 16K Coss \$19.95 32K Disk \$21.95

#### QUESTION



Grades 1-8. Asks questions with multiple choice or oraces 1-b. Asks questions with multiple choice or true and false answers. Fits any curriculum because you can input the questions and answers. Graphic re-ward is a blinking robot. Also designed for use with data topes. Printer use optional. 16K Cass \$19.95 32K Disk \$21.95

#### MATHEACT !

Grade 1-5. Motivates students to learn their facts. All 4 math operations are in the program. Student selects the desired operation then the desired addend, subtrahend, factor or divisor, or then can request a mixed presentation within each operation. 2 skill levels, all drills timed and scored. If all facts are answered correctly, students can play a quick number game as a reward. 16K Cass \$16.95 32K Disk \$18.95

#### HANGWORD & SCRAMBLE

Grades 1-8. Presents 2 word games. Hangword is simi-Grades 1-8. Presents 2 word games. Hangword is similar to the old favorite, Hangman. Blanks appear and students guess letters for the blanks. Wrong guesses build the graphic display of the word 'Sorry'. Scramble displays the word with the letters scrambled. Students guess the word and spell it correctly. Input own words with this program or purchase data tapes. See data tape listing. Printer use optional, 16K Cass \$14.95 32K Disk \$16.95

#### SPELLING

Grades 1-8. Very flexible as it allows you to input your own choice of words and store them on tape files. You may also purchase data tapes for this program. See data tape listing. Words flash on the screen from .1 to 10 seconds, then student types the word. The score is given after each entry and the student is rewarded with a graphic display of words and a song. Printer use aptimol. Printer use optional. 16K Cass \$16.95 32K Disk \$18.95

#### KEYBOARD

Grades 1-6. Helps familiarize student with keyboard. A graphic keyboard enables user to locate keys quickly. Home keys are identified and proper fingering may be taught. Lessons are built around alphabet, finger, word and sentence drills. At the end a graphic reward is given. 32K version has lengthier timed drills. Both 16K and 32K versions can use data tapes for further versions can use data tapes for further practice. See data tape listings. 16K Cass \$19.95 32K Cass \$24.95 32K Disk \$26.95

#### ABC'S

Grades K-1. The child types the letters in the alphabet to the tune of the alphabet song. The reward is a graphic and sound display.

16K Cass \$9.95 16K Disk \$11.95

#### SKIP COUNTING

Grades 1-4. Helps the child learn to count by 1's, 2's, 5's, 10's, 100's, or any number desired. The user selects the parameters by giving the number to count by and the beginning and ending number of each sequence. The student can practice at whatever level needed, and each lesson has a graphic reward.

16K Cass \$16.95

#### DATA TAPE LISTINGS

Data Tapes may be used with other B5 programs. They cannot be used alone.

Use with Keyboard Program
KEYBOARD PHONIC DRILL - Letter, word and sentence finger drills using common vowel and consonant combinations. \$8.95

Use with Keyboard, Spelling or Hangword Programs DOLCH WORDS - 273 words used most often in begin-ning readers. \$8.95

GRADE LEVEL SPELLING - Over 300 words on each tape. Each lesson fallows a phonic rule. Available in Grades 2,3,4,5 or 6 levels. \$8.95 per grade level

SPACE WORDS - Over 300 words to challenge and mo-tivate the superior speller, Grades 4-8. \$8.95

ADULT WORDS - Most often misspelled words. Highly challenging. \$8.95

Use with Questions Program NOUNS AND VERBS - 4 lessons on nouns and 4 on verbs. Grades 3-5. \$8.95

READING COMPREHENSION - Lessons build from simple to complex. Grades 2-4.
Main Idea \$10.95

Sequencing
Fact & Opinion
Cause & Effect
Complete Series of 4 \$10.95 \$10.95 \$10.95 \$39.95



## Ask your Dealer for a Demonstration today! BROCHURES UPON REQUEST

*TRS-80 and COLOR COMPUTER are Trademarks of Tandy Corp.

If unavailable locally, send check or money order to:	QTY. AMT.	QTY. DATA TAPES AMT.
	CLOCK	KEYBOARD PHONIC DRILL
B5 Software	MATHFACT	DOLCH WORDS
1024 BAINBRIDGE PLACE (614) 276-2752	QUESTIONS	GRADE LEVEL SPELLING
COLUMBUS, OHIO 43228	MONEY	GRADE 2 · GRADE 3 · GRADE 4
	SKIP COUNTING	GRADE 5 • GRADE 6
Free Shipping in U.S.A. & Canada	HANGWORD	SPACE WORDS
	SCRAMBLE	ADULT WORDS
TOTAL ENCLOSED	CARRY	NOUNS AND VERBS
	KEYBOARD	READING COMPREHENSION
NAME	BORROW	Company of the same of the sam
ADDRESS	ABC's	SUBTOTAL
CITYSTATE ZIP	SPELLING	SALES TAX
(OH Residents add 51:1% Sales Tax)	A DECEMBER DESCRIPTION OF THE PARTY.	TOTAL ORDER

30 A=RND(9999):B=RND(9999)
40 IF A>9999 OR A<-99999 THEN P
RINT"A>99999 OR A<-99999":STOP
50 IF B>9999 OR B<0 THEN PRINT"B
>9999 OR B<0":STOP
60 B=B*.00010001
70 C(I)=A+B
80 PRINT A,
90 A=INT(C(I))
100 PRINT A
110 PRINT INT(B*10000),
120 B=INT(10000+(C(I)-A))
130 PRINT B
140 NEXT I
150 PRINT MEM

Listing 2

1Ø DIM A(100), B(100)

2Ø FOR I=1 TO 100

3Ø A(I)=RND(99999):B(I)=RND(9999)

8Ø PRINT A(I),

100 PRINT A

110 PRINT B(I),

130 PRINT B

140 NEXT I

150 PRINT MEM

### **Back Issue Availability**

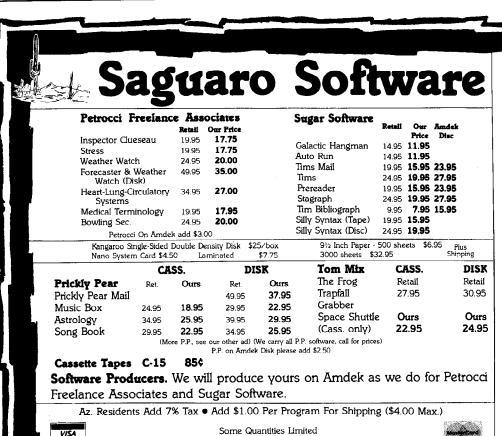
Back copies of many issues of the RAINBOW are still available.

All back issues sell for the single issue cover price—which is \$2 for copies of Volume I, Numbers 1-8 (through February, 1982), \$2.50 for Volume I, Numbers 9, 10 and 12 (through June except May, 1982) and \$2.95 for Volume II, Numbers 9, 10, 11, 12 (March, April, June and July 1983). Also \$2.95 for Volume II, Number 2 (September 1983). In addition, there is a \$3.50 charge per order for postage and handling if sent by United Parcel Service and \$6 for orders sent U.S. Mail. UPS will not deliver to a post office box or to another country. This charge applies whether you want one back issue or all of them.

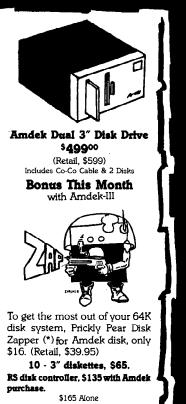
Most back issues are available on white paper in a reprint form. Issues out of print include May, July, August, September, October, November, and December, 1982 and January, February, April, 1983. VISA, Master Card and American Express accepted. Kentucky residents please add 5 percent state sales tax.

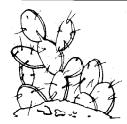
Due to heavy demand, we suggest you order back issues you want now while supplies last.

In addition, copies of the cover *only* of the July, 1982, Anniversary Issue are available separately for \$1 each, plus 50 cents shipping and handling. These are suitable for framing.



7331 E. Beverly - Tucson, AZ 85710 - (602) 885-6508





## PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.



#### Flight

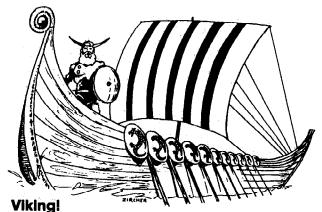
If you'd like to fly a plane then this is what you've been waiting for. A really good graphics oriented flight simulator in high resolution. Four difficulty levels let you go from student level to a difficult instrument-only landing. In front of you on the screen are your instruments, and above them are two representations of your plane in relation to the flight path (top and side views). At the higher levels all you have to go by are the instruments. Can you put it down on the runway to hear the synthesized voice from the tower say "perfect landing"? It's tough! You use your joystick just like the control stick on a plane, and the action is realistic indeed. This program was written by a professional flyer — a pilot for a major United States air carrier, and the high standards of professionalism really show. Just CLOADM and take to the skies! Requires 32K extended. TAPE is \$19.95 - DISK is \$24.95

#### A Partial List of Prickly-Pear Programs

Astrology, Gangbusters, Household Helper. Fantasy Gamer's Package, Viking, Football, Preread I, II & III, Mathpac I, Tarot, I Ching, Numerology, The Great Word Game, The 80C Songbook, Phonics I, Phonics 2, Flight, Las Vegas Weekend, The 8-Bit Bartender, The Fantasy Master's Secretary, Monsters & Magic. Topsy Turvy, Galactic Patrol, Blockade, Sea Wars, Jungle, Spanish . . .

If you are running a disk system, we suggest that you order the disk version, because the cassette version will not run on a disk system without modification or disconnection of the disk controller. The above disk programs require 32K Ram

Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). Az. residents add 6% sales tax. Orders shipped within two days.



A simulation for 1 to 4 persons. Each begins as a landowner, and by farming their land, buying and selling land, expanding their fishing fleet, building on to their manufactory, increasing their population, equiping and training more soldiers, and regulating their taxes, each player tries to increase their economic power and rank until one becomes ruler over all. But beware plagues, rats, raiders, revolts, bad weather, and other misfortunes which may lie along the road to success. As you progress, see the map of your holdings increase. Playable in 1 to 2 hours, and different every time, you may have an addiction problem. \$19.95 tape — \$24.95 disk



#### **Gangbusters**

If you ever wanted to try a life of crime, this is your chance. You will start out as a Punk, but by using brains, and a little muscle, you can rise to become a Hood, Runner, Bookie. Torpedo, Fence, Kingpin, or win by becoming Syndicate Boss. Indulge yourself. Bribe a judge, or the District Attorney. Pay off the Cops. Take out a contract on another player, but watch out, they may be after you. Buy trucking companies, bootleg operations, houses of ill fame, but remember, if you get caught, you may do some hard time. Do you have what it takes to take over? This game will keep you close to your rod, get you thinking about bulletproof glass in your car, and definitely bring out the worst in you, but you'll love every minute of it. For 2 to 6 players, takes about 2 hours to play. Every game is excitingly different. \$19.95 tape — \$24.95 disk

Stocked by Quality Dealers, or

Send Order To: PRICKLY-PEAR SOFTWARE

9234 E. 30th Street Tucson, Arizona 85710 (602) 886-1505

## RAINBOW Info

#### **How To Read Rainbow**

Please note that all the BASIC program listings you will find in the Rainbow are formatted for a 32-character screen—so they will show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match—and your line endings come out the same—you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, do read the text before you start

typing.

Finally, the little cassette symbol on listings indicates that program is available through our *Rainbow On Tape* service. An order form for this service is on the insert card bound in the magazine.



#### The Rainbow Seal

The Rainbow Certification Seal is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product which carries the Seal has been physically seen by us and that it does, indeed, exist.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to the Rainbow for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal. This lets you know that we have seen the product and that it does, indeed, exist.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

There is absolutely no relationship between advertising in the Rainbow and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to any commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

#### **Using Machine Language**

Machine Language programs are one of the features of the Rainbow. There are a number of ways to "get" these programs into memory so that you can operate them.

The easiest way is by using an Editor-Assembler, a program you can purchase from a number of sources.

An editor-assembler allows you to enter mnemonics into your CoCo and then have the editor-assembler assemble them into specific instructions that are understood by the 6809 chip that controls your computer.

When you use an editor-assembler, all you have to do, essentially, is copy the relevant instructions from the Rainbow's

listing into CoCo.

Another method of getting an assembly language listing into CoCo is called "hand assembly." As the name implies, you do the assembly by hand. This can sometimes cause problems when you have to set up an ORIGIN statement or an EQUATE. In short, you have to know something about assembly to hand assemble some programs.

Use the following program if you wish to hand assemble machine language listings:

10 CLEAR200,&H3F00:I=&H3F80 20 PRINT "ADDRESS:";HEX\$(I); 30 INPUT "BYTE";B\$ 40 POKE I,VAL("&H"+B\$) 50 I=I+1:GOTO 20

This program assumes you have a 16K CoCo. If you have 32K, change the &H3F00 in Line 10 to &H7F00.

#### What's A CoCo

CoCo is an affectionate name which was first given to the TRS-80 Color Computer by its many fans, users and owners. As such, it is almost a generic term for three computers, all of which are very much alike.

When we use the term CoCo, we refer to the TRS-80 Color Computer, the TDP System-100 Computer and the Dragon-32 Computer. It is easier than using the three "given" names throughout the Rainbow.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and TRS-80 Color are, for all purposes, the same computer in a different case, these terms are almost always interchangable.

#### The Rainbow Check

The small boxes which you see with programs in the Rainbow are our RAIN-BOW CHECK program, which is designed to help you type in programs accurately.

The check program will count the number of characters you type in. You can then compare the number the RAINBOW CHECK gives you to those printed in the Rainbow. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use the RAINBOW CHECK, type in the program, CSAVE it for future use, then type in the command RUN and press ENTER. Once the program has run, type NEW to remove it from that area into which you will be keying

programs.

Now, whenever you press the down arrow, CoCo will give you the hexadecimal number of bytes in memory. This is to check against the numbers printed in the Rainbow. If your number is different, check the listing carefully to be sure you typed in the proper BASIC program code.

As the hexadecimal number appears in the upper-left corner of the monitor screen, you may want to clear the screen and press the spacebar five or six times to move the cursor out of the way for easy reading. The RAINBOW CHECK counts spaces, too, follow the spacing just as it appears in the magazine.

Here's the program:

10 CLS:IF PEEK(116)=127 THEN X=32688 ELSE X=16304 20 CLEAR 25,X-1 30 IF PEEK(116)=127 THEN X=32688 ELSE X=16304 40 FOR Z=X TO X+77 50 READ Y:W=W+Y:PRINT Z,Y;W 60 POKE Z,Y:NEXT 70 IF W=5718 THEN 80 ELSE PRINT "DATA ERROR":STOP 80 EXEC X:END 90 DATA 182, 1, 106, 167, 141, 0, 68 100 DATA 134, 126, 183, 1, 106, 190 110 DATA 1, 107, 175, 141, 0, 57, 48 120 DATA 141, 0, 4, 191, 1, 107, 57 130 DATA 129, 10, 38, 44, 52, 22, 220 140 DATA 27, 147, 25, 142, 4, 0, 141 150 DATA 6, 31, 152, 141, 2, 32, 25 160 DATA 52, 2, 68, 68, 68, 68 170 DATA 141, 4, 53, 2, 132 180 DATA 15, 129, 9, 46, 4, 139, 112 190 DATA 32, 2, 139, 55, 167, 128, 57 200 DATA 53,22,126,0,0

#### "TRS-80 COLOR COMPUTER PRODUCTS"

#### "ENHANCED 1248-EP EPROM PROGRAMMER"

The list of directly compatible EPROMs increases by one, now including: 2508's, 2758-0/1's, 2516's, 2716's, 2532's, 2732's, 68732-0/1's, 68764's, and 68766's.

#### **NEW FEATURES INCLUDE:**

- 1) Intelligent algorithm that reduces programming time to as little as 1/6 that of fixed cycle programmers.
- 2) Diagnostic routines to isolate defective EPROMs, or locate differences.
- 3) A feature that guards against EPROM type entry errors.
- 4) Diagnostic routines that prevent keyboard entry errors from causing disastrous consequences.

#### FIRMWARE FEATURES

- 1) EPROM ERASED!
- 4) BYTE PROGRAMMING!
- 2) COMPARE EPROM TO RAM!5) DUMP EPROM TO RAM!
- 3) BLOCK PROGRAMMING! 6) JUMP!

Firmware is "stack-oriented", "position independent", and "menu driven". Supplied in an EPROM, it can also be stored on disc or tape for execution from RAM if desired.

#### STANDARD HARDWARE FEATURES

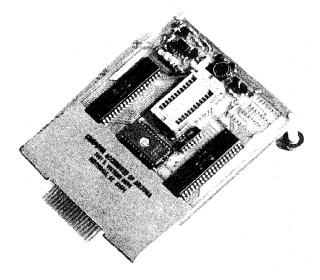
- 1) It has its own "on-board" 25 volt programming supply.
- 2) A quality textool "zero insertion force" (ZIF) socket.
- 3) Socket for firmware on-board.

A PIA port is also available on the programmer. This 8 bit parallel I/O port with handshake lines, can be used for many applications, such as a parallel printer port. Details on how to use this port as a printer interface are included in the instruction manual.

The instruction manual describes how to take full advantage of the power of this versatile programmer. We think you'll agree, that never before was an EPROM programmer so easy to use, and feature packed as is the 1248-EP.

The enhanced 1248-EP costs only \$129.95.

Firmware upgrades are available to our previous 1248-EP customers, in EPROM, for just \$29.95.



★ TRŞ-80 is a trademark of TANDY CORP.
★★ SDS80C is a trademark of the MICRO WORKS

#### "THE CK4 SERIES PROM/RAM CARDS"

The CK4 cards work with 2K, 4K, and 8K ROMs or EPROMs of the 5 volt only variety in 24 pin packages. The CK4 can also work with static RAMs, and increase your available memory by as much as 16.128 bytes.

The CK4-1 is specifically designed for use in computers with "F" series boards, or those machines that are "write protected" in the address range of \$C000 through \$FEFF. The CK4-1, therefore, does not incorporate features designed in the CK4 for use with RAM.

The CK4-2 is the unpopulated version of the CK4 series board. Buy this version and configure to meet your specific requirements, and stretch the value of your dollar.

#### FEATURES SUMMARY

1) MIX ROM AND RAM! 2) EXPAND RAM FROM 2-16K! 3) YOU WRITE PROTECT RAM! 4) EXTREMELY FLEXIBLE DECODING 5) PROVIDES FOR BATTERY BACKUP! 6) LOW COST!

#### PRICES

CK-4 \$29.95 ea.

CK4-1 \$27.95 ea.

ČK-2 \$15.95 ea.

## NEW PRODUCT OFFERING A/D-80C ANALOG TO DIGITAL CONVERTER BOARD

The A/D-80C is a 16+ channel analog to digital converter with two 8 bit PIA ports plus handshake lines.

*Implement closed-loop control of analog processes!
*Use it to control your homes environment!
*Computerize your laboratory or darkroom!
*Build a multi-channel voltmeter!
*Use it for waveform generation!
*For robotics!

The A/D-80C is software programmable up to a maximum of 10 bits of resolution. The number of channels can be expanded beyond the 16 channel capability supplied, and the channels are software selectable.

The A/D-80C performs nearly 9K A/D conversions per second.

A generous area of the board is designated for wirewrapping to permit customization of analog signal processing circuitry.

Extensive documentation is provided to assist the user in the development of his application. Software listings are provided as an aid to software development, and a socket is provided for an EPROM for user developed software drivers.

CONSULT FACTORY FOR AVAILABILITY AND PRICE INFORMATION ON NEW PRODUCTS

#### **FACTORY FRESH COMPONENTS:**

ITEM	DESCRIPTION	PRICE
2716 EPROM		\$4.50 ea.
2532 EPRON	1 4K by 8 bit,	\$6.50 ea.
6821P	P.I.A.	\$3.50 ea.
74LS156	Open collector decoder	\$1.70 ea.
Socket	Textool "Zero Insertion Force"	\$9.00 ea.
	Minimum component order: \$25.00	

#### **ORDERING INFORMATION:**

Add \$3.00 to all orders to cover shipping and handling. Canadian residents add 5% to cover special handling. Arizona residents add 5% sales tax. All items shipped UPS. Please allow 2-3 weeks for delivery. Prices subject to change without notice.

Make checks payable to:

COMPUTER ACCESSORIES OF ARIZONA 5801 E. VOLTAIRE DRIVE SCOTTSDALE, ARIZONA 85254 (602) 996-7569

## THESE FINE STORES CARRY THE RAINBOW

The retail stores listed below carry the Rainbow on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

	Computer	users. we sug	gest you patronize those		
ALÁBÁMA	1	GEORGIA		MARYLAND	The Designation Office
Birmingham	Jefferson News Co.	Atlanta	Chips, Inc.	Baltimore Kensington	The Program Store The Program Store
	Software City		Guild News Agency Hands On Computer	Rockville	The Software Store
Horence	Anderson News Co. Madison Books		Software Atlanta	MASSACHUSETTS	
Madišon Mobile	Computerland	Columbus	Muscogee News Co.	Cambridge	Ninis Corner, Inc.
Montgomery	Trade 'N' Books	Marietta	Act One Video	i i	Out Of Town News The Program Store
ALASKA		IDAHO Boise	Magnum Computer	Dalton	Blue Max, Inc.
Anchorage	Radio Shack Electronic World	boise	Products	Littleton	Computer Plus
Fairbanks ARIZONA	Electronic World	ILLINOIS		Mansfield	Software Shop
Glendale	Road Runner Computer Products	Arlington	2	Woburn MICHIGAN	Microcon Softwarecenters
Mesa	Personal Computer Place	Heights Aurora	Software City Kroch's & Brentano's	Ann Arbor	Community News Center
Phoenix	Home Brew Computers	Bensenville	James Conway Corp.	Brooklyn	Weatherwax Radio Shack
	The Computer Shop Software City	Champaign	Book Market	Dearborn	DSL Computer Products
	Tri-Teck Computers		Bob's in Newtown	Durand Fenton	Robbins Electronics Tri-County Electronics Radio Shack
Scottsdale	Data Concepts		Bob's News Emporlum Bob's Rogers Park	Flint	"I O"
Ciamm \ Gatin	Soffwareland Corp. Livingston Books		Book Market	Kalamazoo	John Rollins
Sierra Vista Tempe	All Systems Go		East Cedar	Lansing	The Alternate Source
TOTTIPO	Books Etc.		North Cicero	Lapeer	Computer Corner User Friendly
Tucson	Anderson News Co.		West Diversey Chas. Levy Circulating Co.	Livonia	Level IV Products
	Software City Software Unlimited		E.B. Garcia & Associates	Muskegon	The Eight Bit Corner
Yuma	Soft Shop		Guild Books & Periodicals	Novi	MI Software Dist., Inc.
ARKANSAS	Son Shop		Kroch's & Brentano's	Owosso	C/O Computer Systems Hi-Fi Audio Cò.
Little Rock	Anderson News Co.		South Walbash West Jackson	Perry	Perry Oil & Gas
CALIFORNIA	Floatrobraio		516 N. Michigan	Pontiac Pontiac	Computer Shack
Atwater Citrus Heights	Electrobrain Söftware Plus		835 N. Michigan	Rochester	Rochester Book Center
Downey	The Floppi Disk		Parkway Drugs	Roseville St. Johns	New Horizons Clinton Electronics
El Cajon	Radio Shack		Parkwest Books Sandmeyer's Bookstore	Southfield	Software City
Exton	Software City R&V Sound		Univ. of Chicago Bookstore	Sterling Heights	Sterling Book Center
Fortuna Haif Moon Bay	Strawflower Electronics		Univ. of Illinois Bookstore	Utica	Byte By Byte
Hollywood	Levity Distributors	Ď	Videomat, Inc.	MINNESOTA Brooklyn	
Lancaster	Alpha Computer Equip. Co.	Danville DeKalb	Book Market Appletree Computers	Center	Gopher Hole
Los Angeles	OPAMP Technical Books Software Mart	Evanston	Chicago-Main News	Minneapolis	Read-More News
Modesto Morro Bay	Coast Electronics	Lisle	Book Nook	MISSOURI	
National City	Willy's Electronics	Newton	Bills TV Radio Shack	Kansas City	Midwest CoCo Systems Magic World
Northridge	HW Electronics	Oak Brook Oak Park	Kroch's & Brentano's B.I.E.S. Systems	St. Louis	Softwaire Centre
Pacific Beach	Pro Am Electronics Printers, Inc.	CORPOR	Kroch's & Brentano's	Springfield	January Books
Palo Alto Riverside	Selectronics	Peoria	Book Market	University City	Final Edition
Sacramento	North Area News	Ò-1	Illinois News Service	NEBRASKA	Hobby Town
2. 20.	Softwaire Center	Schaumberg	Data Domain Kroch's & Brentano's	Lincoln Omaha	Computers & Components
San Diego	Accolade Distributors Computer Dimension	Skokie	Kroch's & Brentano's	NEVADA	SST POTEIN & SST POTEIN
	The Computer Store	S. Holland	Abacus Computers	Las Vegas	Hurley Electronics
	Dimensional Software	Taylorville	Wilson's Radio Shack	Spark	Computer House
	Disney's Electronics	Wheaton Wheeling	Skyline Marketing North Shore Distributors	NEW HAMPSHIRE Milford	New England Periodical Serv.
Santa Rosa	Radio Shack Software 1st	INDIANA	TOM OF OR DISTRICT	Peterborough	Radio Shack
Southgate	Color Computing	Crown Point	Unelex Software	Portsmouth	Portsmouth Computers
Stockton	Steven Moreno	Elkhart	Elkhard City News	West Lebanon	Verham News Corp.
Torrance	Softwalre Centre Int. Adobe Electronics	Garrett Greenwood	Finn News Agency The Computer Experience	NEW JERSEY Bergenfield	Software City
29 Palms COLORADO	Adobe Electronics	Indianapolis	A-Computer Store	Cedar Knolls	Village Computer & Software
Aurora	Aurora Newsland		Bookland, Inc.	Cherry Hill	Software City
Bolder	The Computer Connection		Game Preserve Indiana News	Clinton	Micro World II
Colorado	Hadhan and Managarings	Jasper -	Computer Store	E. Windsor Englishtown	Software 'n' Suds Software City
Springs Denver	Hathaway's Magazines Wholellfe Dist.	04400	Elex Mart	Fairlawn	Software City
CONNECTICUT		Lawrenceburg	Bauer Electronics	Fairview	Software City
Danbury	Computer Serv. of Danbury	Madison	Computer Services Arcs Office Supplies	Freehold	Radio Shack
Hartford	The Aetha Life Club Store	Martinsville	Rádio Shack	Lawrencevillé Linwood	Micro Con Software Center Software City
Orange . <b>DELAWARE</b>	Software City	Scottsburg	Radio Shack of Scottsburg	Midland Park	Software City
Wilmington	Normar, Inc.—The Smoke Shop	Walbash	Mitting's Electronics	Montvale	Software City
DISTRICT OF COL		IOWA Bettendorf	Cosmos Computers	Nahwah Pennsville	Computer Discount of N.J. Dave's Elect, Radio Shack
EI ODIDA	The Program Store	Davenport	Software City	Pinebrook	Software City
FLORIDA Clearwater	Soenen & Wilmoth Books	KANSAS		Red Bank	Computer Library
Cocoa	Space Coast Software	Hays	Gulliver's Inc.	Dian Estab	Software City Software City
Coconut Creek	Data Base	Junction City Kansas City	III #'s Stereo Special Computer Support	River Edge Rockaway	Software Station
Ft. Lauderdale	Mike's Electronics Distributor Software Connection	Topeka	Palmer News, Inc.	Summit	Software City
Kissimmee	Radio Shack & Elec. Hut	· '	Town Crier of Topeka, Inc.	Teaneck	Software City
Longwood	Adventure International Store	Wichita	Amateur Radio Equipment Co. Llova's Radio	Wayne <b>NEW MEXICO</b>	Wayne Software
Miami	Computer Image	KENTUCKY	доуа s касло	Albuquerque	Page One Newsstand
	Joe's News Micro Byte	Benton	Anderson Electronics	, 11500001001	Salt of the Earth
	The News Rack	Crestwood	Begley Drugs	. Artesla	Radio Shack F756
Orlando	The Alamo	Harrodsburg Hapking ille	M & W Electronics Hobby Shop	NEW YORK	Buffalo Teknologies
	All Systems Go	Hopkinsville Louisville	The Computer Store	Amherst E. Rochester	Buffalo Teknologies The Software Shop
Pánama City	Software Unlimited Computer Systems Group	Paducah	Radio Shack	East Syracuse	The Data Phile Co.
Pensacola	Anderson News Co.	Paintsville Paintsville	Gus-Stan Enterprises	Fairport	Software City
Sarasota	Family Computers	Pikeville LOUISIANA	Gus-Stan Enterprises	Great Neck Johnson City	Software City Unicorn Electronics
Courth	Software City	Baton Rouge	Acme Book Co.	Johnson City Melville	Imperial News
South Pasadena	Poling Place	Shreveport	Computer SOS	Mt. Kisco	Discount Personal Comp. Sftw. Sys.
Stuart	Caribbean Engineering Corp.	Slidell	Radio Shack 7181	New York	Barnes & Noble—Sales Annex
Tallahassee	Andérson News Co.	MAINE	Oʻlpridin's Electronic Svd. Ctr.		Big Apple Software Co. Coliseum Books
Tampa	Software City Software Store	E. Wilton Jay	F.M. Electronics	1	The Computer Center
	Sound Trader & Computer Center	South Portland	Portland News Co.	1	Eastern Newsstand
Winter Park	Independent Computer Systems	Waterboro	Řadló Shack		Grand Central Station, Track 37

200 Park Ave., (Pan Am #1) 55 Water Street World Trade Center #2 Stop News Idle Hours Bookstore International Smoke Shop Jonil Smoke State News Walden Books N. White Plains Software City Village Gree World Wide News Frank Hogg Laboratory Computer Resource Woodhaven NORTH CAROLINA Spectrum Projects

Papers & Paperback Southern Software The Memory Bank K & S News Stand

Williamsville

ocky Mount

Winston-Salem

NORTH DAKOTA

Hickory

Salisbury

Canton Cincinnati

Cleveland

Columbus

Coshocton

Dayton

Fairborn

Lakewood

Mansfield

Niles

OREGON

Medford

Portland

Altoona

Malvern

Exton

Avondale

Greensburg

Philadelphia

Phoenixville

Pittsburgh

Grant's Pass

PENNSYLVANIA

Fargo

OHIŌ

Computer Associates

Little Professor Book Center Color Software Center Jerry's Computer Software City The Program Store Utopia Software Wilke News News-Readers Lakewood International News Brunner News Agency

Mayfield Heights Programs Unlimited Miamisburg Wilke News Computer Showcase Little Professor Book Center Leo's Book & Wine Shop Philadelphia Toledo Reitz Electronics Westerville Home Computer Store

Edu-Caterers

PCLEAR 80

**OKLAHOMA** Computers 'N' Stuff Muskoaee Radio Shack Merit Micro Software Software Plus Oklahoma City Stillwater D. Data ne Computer Store Tulsa Woodward H & H Electronics

> Libra Books L & R Electronics John's News Stand 80-Plus Rainy Day Bookshop

Software City Newborn Enterprises Perry's News Shop Software City The Program Store Personal Software Stevens Radio Shack

All-Pro Souveniers

Pleasant Hills Plymouth Meeting Tunkhannock Whitehall Williamsport York

RHODE ISLAND

Greenville

TENNESSEE

Knoxville

Memphis

Nashville

Smyrna

Austin

Beeville

Conroe

Denton

Ft. Worth

Houston

Salt Lake City

Alexandria Falls Church

WASHINGTON

VIRGINIA

Gafton

Richland

Spokane

Seattle

Tukwila

Elkins

Vancouver

Wenatchee

**WEST VIRGINIA** 

Kingwood

WISCONSIN

Appleton Cudahy

**Janesville** 

Milwaukee

Parkersburg

Elgin

Dallas

N.Charleston

Chattanooga

The Program Store The Donna Comm. Co. Software City Shade Tree

Pitt Computer & Software

The Computer Center of York Warnick SOUTH CAROLINA Software Center of Rhode Island

Data Byte Computer Center Palmetto News Co. The Green Dragon

Anderson News Co. Chattanooga Choo-Choo Anderson News Co. First Byte Computer Co. omputer Center Tobacco Corner Newsroom Campus Computer Corp. Mills Book Store

Austin News Agency, Inc. Capitol Microcomputers Software & Things Bee Electronics Crouchet Electronics Dallas Computer Center Software Concepts

Delker Electronics

Audio Concepts Unlimited The Homing Pigeon RFI Flectronics Software Terminal MicroSolutions Recycle Computers Software, Etc.

Irving San Antonio Software Access Coles Computer Center UTAH

Quality Technology Alonso Book & Periodical The Program Store Electronics Marketing Software City

Software City Data Borne C & J Electronics Computer Center Adams News Co., Inc.

Bits, Bytes & Nibbles Programs Plus Northwest Effect Software Etc.

Binary Tree Appalachian Computing Valley News Service

Badger Periodicals Cudahy News & Hobby Book World Booked Solid Booked Solid II

Wauwatosa

Computer Software Center Harvey Schwartz Bookshop Prospect News & Magazine: Univ. of Wisconsin Bookshop Acom Computer Systems

WYOMING The Computer Store Casper

CANADA: ALBERTA

Fairview

Fox Creek

Ft. Macleod

Grande Prairie

Athabasca McLeans Ltd. Barrhead Barrhead Sound 1982 Ltd. Double "D" A.S.C. Radio Shack Imperial Computer Ltd. Calgary Rainbow Software Services Radio Shack

Camrose Claresholm) Radio Shack Coaldale Coaldale Sight & Sound Drayton Valley

Langard Electronics CMD Micro Kelly Software Distributors Radio Shack D.N.R. Furniture & TV Fox City Color & Sound Radio Shack Grande Cache Grande Centre The Stereo Hut The Book Nook Northern Computer Service Technics TV Ltd.

Hanna Leduc Radio Shaci Radio Shack Lloydminster Peace River Radio Shack Pincher Creek Thornton & Son's Red Deer Computerworld St. Paul Tele-Loaic Pynewood Sight & Sound Don's Radio Shop Taber Vallewiew Vermilion Photocraft Vermilion Ltd. Wetaskiwin Radio Shack

**BRITISH COLUMBIA** Compulit Burnaby

Ft. St. John N. Vancouver Microwest Distributors Victoria Internatioal Software MANITOBA Winnipeg J & J Electronics Ltd.

NOVA SCOTIA Dartmouth Halifax Sector Software Atlantic News ONTARIO

**Bowmanville** Bowmanville Audio Vision LTD Hamilton Galls Book World Prism Software Kingston London T.M. Computers Multi-Mag National News Co.Ltd. Ottawa Intercity News Co., Ltd.

QUEBEC Soc. De Loc SASKATCHEWAN

George Glass Regina Saskatoon Computertime YUKON

> Blg Byte Computer Services H & H Electronics

PUERTO RICO

Whitehorse

Software City

## ARE YOUR WALKING FINGERS GETTING FOOTSORE

Tired of typing in those long, but wonderful, programs from each issue of the RAINBOW? Now, you can get RAINBOW ON TAPE and give those tired fingers a rest. With RAINBOW ON TAPE, you'll be able to spend your time enjoying programs instead of just typing...typing...typing them! All you need to do ever again is pop a RAINBOW ON TAPE cassette into your recorder, CLOAD and RUN any one you want.

RAINBOW ON TAPE is available as a single issue for \$6.50 or on a yearly subscription basis for only \$60. It is the perfect complement for the **RAINBOW** itself.

VISA, MasterCard and American Express accepted. All subscriptions begin with the current issue and back issues are available beginning with April, 1982. Subscriptions are sent first class mail to coincide with the arrival of your current issue of the RAINBOW.

Now . . .

### The Best Color Computer Magazine Offers The Best Tape Service

Think of it! Not 10 or a dozen—but between 20 and 30—programs every month from Rainbow On Tape. All the really good programs from the Rainbow! All the long ones . . . so you don't have to type them in. Just CLOAD and RUN!

> ORDER RAINBOW ON TAPE TODAY! HANDY ORDER CARD BETWEEN PAGES 34 and 35

#### ADVERTISER'S INDEX

We encourage you to patronize our advertisers—all of whom support the TRS-8 computers. We will appreciate your mentioning the RAINBOW when you contact the

A made and 80	Control of the contro	
Address Computers 268	Desert Press Inc	Nanos
Abacus Computers	Desert Press, Inc	Nelsor New S
Access Programs Marketing62	Digital-Linear Systems Eng	New S North
Adventure International12	Dorrsett	Oelric
All American Ultra-Light Industry 124	Double Density Software	Orego
All Color Software	Dragon User	Owl's
All Systems Go194	DSL Computer Products 209	Owl-V
AMDEK Corp	Dugger's Growing Systems263	Parso
A. M. Hearn Software 285	Dymax196	PBJ, Ir
American Library & Info Services 284	Dynamic Electronics	PCLEA
Arizona Discount Software 127	Eaton Computer Products	Peace
Arizona Discount Software	Elite Software	Platin
Armadillo International	Emmons Software 200	Prebt
Aurora Software	Endicott Software	Prickl
B&B Software100	Erickson, B	Prism
B.C. Engineering	EVS22	The P
Basic Programs	Federal Hill Software55	The P
Basic Technology 305	Follett Educational Systems 25	The P
Bertamax9	Freeland Engineering	PXEC
Better Software	Gem Mount Mfg	Pyrar
B5 Software	Genesis Software	QCS Q-So
Botek Instruments	GIMIX	Q-So Quas
Bumblebee Software271	Harcourt Brace Janovich, Inc	Radi
Calc-Soft195	Harmonycs	Rain
Cer-Comp	Hawkes Research Services	RAIN
Challenger	HJL293	Rain
Chattanooga Choo-Choo	Frank Hogg Laboratory 157, 158, 159	Rain
Software	Home Base Systems	Real
Chris Computers	Hot CoCo	Reitz
Chroma Systems         140           Chromasette         290	Howard Medical	REM S & S
Circle City Software30	Hyperion	Sagi
Classical Computing	Illustrated Memory Banks 243	SAV-
CoCo Data Enterprises	Inter+Action	SDS
CoCo Hut240	Intercept Enterprises	SP Sof
CoConut Products	International Color Computer	Selec
CoCo Pro	Club	Sense
CoCo Warehouse	Intracolor	Sham
Cognitec	JARB Software	Silicor
Color Micro Journal	JoMar Sales	Skylin
Colorquest	J-NOR Industries	Softia
Color Software Services	JPS	Softwo
	Kaleidoscopic Creations100	Softwo
Color Soft Software	Kalglo Electronics245	Softwo
Colorware	K&K Computorware	Softwo
Compukit 286	Key Color Software	South
Computer Accessories	KRT Software	Spect
of Arizona	Land Systems	Spect
Computer Dynamics280	Leader Sales Corporation134	Spect
Computer Entrepreneur	Leading Edge IBC	
The Computer House	Litefrac Software, Inc	Speed
Computer Plus	Mark Data Products	Star-Ki
Computer Shack 149 150 151	Market Timing	Hoyt S
Computer Shack 149, 150, 151 Computers Unlimited 208	Med Systems Software244	Sugar
Computer Systems Center	MEGA-Byte Software	Japon
Computerware	Micon Enterprises	T&DS
Control Craft, Inc	Micro Catalog161	Tano N
Cosmos Computer Services, Inc 46	Micro-80145	
Creative Lectronics	Micrologic	Transfe
Custom Software Engineering 289	Micro Script Inc	Transiti 29 Ente
Cy-Burnet-ICS	Micro Script, Inc	Vidtror
Data-Comp 104, 116, 117, 118, 119	The Micro Works125	Wasats
Datacomp Computer Systems 180	Mr. R's Software92	Washir
Dataman85	Tom Mix Software 106, 107, IFC	The We
Data Mania48	ML-US'R Software110	Word N
Datasoft	Moreton Bay	World I
Delker Electronics	M & S Software	TOR-10